

## APPENDIX C: REQUIREMENT VERIFICATION MATRIX FOR AMS-02 PAYLOAD INTEGRATION HARDWARE (PIH)

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
P-1	PTRS JSC 29789	3.2.1.1.1	A	Transition Radiation Detector (TRD) and Upper Time of Flight (TOF) Structural Interfaces – Location	The PIH shall provide structural interfaces to locate the TRD and Upper TOF at the top of the AMS-02 experiment stack so that the TRD/Upper TOF is centered above the Cryomagnet and the top surface of the TRD is 57.48 inches above the AMS-02 origin X-Y plane. [NOTE: Upper TOF is attached to the TRD at the TRD Corner Brackets. (Reference JSC 29095, paragraph 4.1.6.1-D-1)]				
P-2	PTRS JSC 29789	3.2.1.1.2-A	A	Cryomagnet System (Includes Cryomagnet, SFHe Tank, and Support System) Structural Interfaces – Location	The PIH/Vacuum Case shall provide structural interfaces to locate the AMS-02 Cryomagnet System within the Vacuum Case.				
P-3	PTRS JSC 29789	3.2.1.1.2-B	A	Cryomagnet System Structural Interfaces – Cabling	The PIH/Vacuum Case shall provide feed-thru ports for cabling to the Cryomagnet system.				
P-4	PTRS JSC 29789	3.2.1.1.2-C	A	Cryomagnet System – Air Exclusion	The PIH/Vacuum Case shall prevent air from contacting the surfaces of the SFHe Tank and the Cryomagnet system by maintaining a vacuum of at least $1 \times 10^{-6}$ torr.				
P-5	PTRS JSC 29789	3.2.1.1.2-D	A	Cryomagnet System – Cryocooler Interfaces	The PIH/Vacuum Case shall provide interfaces for five cryocoolers used to help maintain the cryogenic temperature of the SFHe in the tank.				
P-6	PTRS JSC 29789	3.2.1.1.2-E	A	Cryomagnet System – Cryocooler Access	The PIH/Vacuum Case shall provide access ports at the five cryocooler locations.				
P-7	PTRS JSC 29789	3.2.1.1.2-F	A	Cryomagnet System – Fill Port	The PIH/Vacuum Case shall provide an interface for the SFHe Tank fill port.				
P-8	PTRS JSC 29789	3.2.1.1.2-G	A	Cryomagnet System – Emergency Vent	The PIH/Vacuum Case shall provide an interface for an emergency vent for the SFHe Tank.				
P-9	PTRS JSC 29789	3.2.1.1.2-H	A	Cryomagnet System – Pressure Relief System	The PIH/Vacuum Case shall provide interfaces for an emergency pressure relief system for the Vacuum Case.				
P-10	PTRS JSC 29789	3.2.1.1.2-I	A	Cryomagnet System – Plumbing	The PIH/Vacuum Case shall provide feed-thru ports for the plumbing of gas lines to the gas-operated valves for the SFHe.				
P-11	PTRS JSC 29789	3.2.1.1.3	A	Anti-Coincidence Counter (ACC)	The PIH shall provide structural interfaces for mounting the ACC within the inner cylinder of the Vacuum Case.				

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P-12	PTRS JSC 29789	3.2.1.1.4	A	Tracker	The PIH shall provide structural interfaces for mounting the Tracker within the inner cylinder of the Vacuum Case.				
P-13	PTRS JSC 29789	3.2.1.1.5	A	Lower Time of Flight (TOF)	The PIH shall provide structural interfaces to locate the Lower TOF within the Lower Conical Flange of the AMS-02 Vacuum Case directly below the Tracker and centered below the Cryomagnet.				
P-14	PTRS JSC 29789	3.2.1.1.6	A	Ring Imaging Cherenkov Counter (RICH)	The PIH shall provide structural interfaces to locate the RICH directly below the Lower TOF and centered below the Cryomagnet.				
P-15	PTRS JSC 29789	3.2.1.1.7	A	Electronic Calorimeter (ECAL)	The PIH shall provide structural interfaces to locate the ECAL directly below the RICH and centered below the Cryomagnet.				
P-16	PTRS JSC 29789	3.2.1.1.8	A	TRD Gas Supply System	The PIH shall provide structural interfaces for the TRD Gas Supply System.				
P-17	PTRS JSC 29789	3.2.1.1.9	A	Integrated Radiators, Debris Shield and Electronic Box Assemblies	The PIH shall provide structural interfaces for the RAM and Wake Integrated Radiator, Debris Shield and Electronic Box Assemblies.				
P-18	PTRS JSC 29789	3.2.1.1.10	A	AMS Experiment Plumbing, Cabling, and Other Miscellaneous Hardware	The PIH/Vacuum Case shall provide generic interfaces for securing gas and fluid lines, electrical cables, and other miscellaneous experiment hardware.				
P-19	PTRS JSC 29789	3.2.1.2.1-A	A	STS Structural Interfaces	The PIH shall provide structural interfaces with the Shuttle Orbiter (in the Cargo Bay) via four sill trunnions and one keel trunnion.				
P-20	PTRS JSC 29789	3.2.1.2.1-B	A	STS Structural Interfaces	The sill and keel trunnions shall meet the requirements of NSTS-21000-IDD-ISS, Section 3.3.1.				
P-21	PTRS JSC 29789	3.2.1.2.2-A	A	STS Power and Data Interfaces	The PIH power and data interfaces shall be through the Remotely Operated Electrical Umbilical/Payload Disconnect Assembly (ROEU/PDA) on the Orbiter side.				
P-22	PTRS JSC 29789	3.2.1.2.2-B	A	STS Power and Data Interfaces	The PIH shall provide pass-through 124 Vdc power up to 2 kilowatts (kW) from the APCUs on the Orbiter to the PDS via the ROEU/PDA and Interface Panel A.				
P-23	PTRS JSC 29789	3.2.1.2.2-C	A	STS Power and Data Interfaces	The PIH shall provide pass-through GSE 120 Vdc power up to 2 kW from the T-0 umbilical to the PDS via the ROEU/PDA and Interface Panel A.				
P-24	PTRS JSC 29789	3.2.1.2.2-D	A	STS Power and Data Interfaces	The PIH shall provide pass-through GSE TBD Vdc power at 200 watts (W) from the T-0 umbilical to the Vent Pump via the ROEU/PDA and Interface Panel A.				

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P-25	PTRS JSC 29789	3.2.1.2.2-E	A	STS Power and Data Interfaces	The PIH shall provide pass-through momentary 28 Vdc ascent power at up to 4 amps (A) from a Standard Switch Panel (SSP) in the Orbiter Aft Flight Deck (AFD) to the AMS-02 Vent Valve Electronics via the ROEU/PDA and Interface Panel A.				
P-26	PTRS JSC 29789	3.2.1.2.2-F	A	STS Power and Data Interfaces	The PIH shall provide pass-through command and data handling cables from the Orbiter to the AMS-02 front-end data acquisition box (J-Crate) via the ROEU/PDA and Interface Panel A. Two sets of cables (including bus couplers) shall be used for 1553 communications at 20 kilobytes per second (kbps) to two separate Remote-Terminals (RTs) on AMS-02, and one set of cables shall be used for a redundant set of high rate data at 2 Megabytes per second (Mbps) via RS-422 connection.				
P-27	PTRS JSC 29789	3.2.1.2.2-G	A	STS Power and Data Interfaces	The PIH shall provide pass-through command and data handling cabling from the Orbiter Backup Flight System (BFS) General Purpose Computer (GPC) to the AMS-02 Vent Valve Electronics via the ROEU/PDA and Interface Panel A (Discreet Output, Low 5 Vdc).				
P-28	PTRS JSC 29789	3.2.1.2.2-H	A	STS Power and Data Interfaces	The PIH shall provide a digital data recording system-02 (DDRS-02) for recording high rate data (2 Mbps avg) from the AMS-02 payload on-orbit operations. The DDRS-02 shall consist of an Orbiter Payload General Support Computer (PGSC) and Payload provided interface boards, cabling, and software.				
P-29	PTRS JSC 29789	3.2.1.2.2-I	A	STS Power and Data Interfaces	The PIH shall provide cables to route one channel of the RS-422 data (2 Mbps) to the T-0 during ground operations and another cable to route the same data to the DDRS-02 via the Payload Data Interface Panel (PDIP) on the Orbiter mid-deck				
P-30	PTRS JSC 29789	3.2.1.2.2-J	A	STS Power and Data Interfaces	The PIH shall provide cabling to route another channel of the RS-422 data (2 Mbps) to the Ku-Band at the PDIP.				
P-31	PTRS JSC 29789	3.2.1.3.1-A	A	ISS Structural Interfaces	The PIH shall provide structural interfaces with the ISS upper inboard Payload Attach Site on the Starboard 3 (S3) Integrated Truss Segment (ITS) via the active Payload Attach System (PAS) on the truss and the passive PAS on AMS-02.				
P-32	PTRS JSC 29789	3.2.1.3.1-B	A	ISS Structural Interfaces	The PIH/PAS shall permit/facilitate the robotic berthing of the AMS-02 Payload.				
P-33	PTRS JSC 29789	3.2.1.3.1-C	A	ISS Structural Interfaces	The PIH/PAS shall provide an EVA flight releasable capture bar to facilitate payload unberthing in a contingency situation.				

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P-34	PTRS JSC 29789	3.2.1.3.2-A	A	ISS Power and Data Interfaces	The PIH power and data interfaces shall be through the Umbilical Mechanism Assembly (UMA) active half on the ISS side and the UMA passive half on the AMS-02 side.				
P-35	PTRS JSC 29789	3.2.1.3.2-B	A	ISS Power and Data Interfaces	The PIH shall provide two (Power A, Power B) pass-through 120 Vdc power feeds (2.4 kW continuous, 2.8 kW max) from the ISS to the PDS via the UMA and the EVA Interface Panel.				
P-36	PTRS JSC 29789	3.2.1.3.2-C	A	ISS Power and Data Interfaces	The PIH shall provide two (Bus A, Bus B) pass-through MIL-STD-1553 command and data handling buses (20 kbps) from the ISS to the AMS-02 front-end data acquisition box (J-Crate) via the UMA and the EVA Interface Panel.				
P-37	PTRS JSC 29789	3.2.1.3.2-D	A	ISS Power and Data Interfaces	The PIH shall provide a pass-through fiber optic High Rate Data Link (HRDL) interface (125 Mbaud, 40 Mbps peak, 2 Mbps) from the ISS to the AMS-02 front-end data acquisition box (J-Crate) via the UMA and the EVA Interface Panel.				
P-38	PTRS JSC 29789	3.2.1.3.2-E	A	ISS Power and Data Interfaces	The PIH shall provide a secondary fiber optic HRDL interface (125 Mbaud, 40 Mbps peak, 2 Mbps orbit avg) from the EVA Interface Panel to the AMS-02 front-end data acquisition box (J-Crate). This will only be used for contingency purposes.				
P-39	PTRS JSC 29789	3.2.1.4.1	A	Shuttle Remote Manipulator System (SRMS) Interfaces Functional Requirements	A Space Shuttle Program (SSP) provided FRGF serves as the interface between the AMS-02 Payload and the SRMS. The FRGF shall be mounted to the PIH to facilitate grappling of the payload in the Orbiter payload bay with the SRMS, removing it from its berthed position, and extending it to the robotic hand-off position.				
P-40	PTRS JSC 29789	3.2.1.4.2-A	A	Space Station Remote Manipulator System (SSRMS) Interfaces Functional Requirements	The PVGF shall be mounted on the PIH to facilitate robotic hand-off of the payload from the SRMS and subsequent berthing on the S3 Truss by the SSRMS.				
P-41	PTRS JSC 29789	3.2.1.4.2-B	A	Space Station Remote Manipulator System (SSRMS) Interfaces Functional Requirements	The PIH shall provide cabling for redundant (Bus 1 & Bus 2) pass-through 120 Vdc power (<1800 W) from the SSRMS via the PVGF to the EBCS.				

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P-42	PTRS JSC 29789	3.2.1.4.2-C	A	Space Station Remote Manipulator System (SSRMS) Interfaces Functional Requirements	The PIH shall provide pass-through 120 Vdc power (<1800 W) for both Bus 1 and Bus 2 from the EBCS to the AMS-02 payload, to supply contingency heater power during transfer operations.				
P-43	PTRS JSC 29789	3.2.1.4.2-D	A	<i>Space Station Remote Manipulator System (SSRMS) Interfaces Functional Requirements</i>	The PIH shall provide routing for redundant video cabling from the EBCS to the SSRMS via the PVGF for the transmission of video signals to the ISS.				
P-44	PTRS JSC 29789	3.2.1.4.2-E	A	Space Station Remote Manipulator System (SSRMS) Interfaces Functional Requirements	The PIH shall provide a method to secure and terminate cables from the PVGF that provide services that are not used by AMS.				
P-45	PTRS JSC 29789	3.2.1.5-A	A	EVA Interfaces Functional Requirements	Attached Payloads shall be designed such that all operations are performed via EVR with contingency EVA capability.				
P-46	PTRS JSC 29789	3.2.1.5-B	A	EVA Interfaces Functional Requirements	Attached Payloads shall be designed to the sharp edge, protrusion, and glove temperature requirements of NSTS 07700, Volume XIV, Appendix 7, even if EVA is not planned or anticipated.				
P-47	PTRS JSC 29789	3.2.1.5-C	A	EVA Interfaces Functional Requirements	EVA contingency operations shall be performed by a crewmember restrained at the end of the SSRMS. (TBR)				
P-48	PTRS JSC 29789	3.2.1.5-D	A	EVA Interfaces Functional Requirements	EVA aids shall be provided in all locations necessary to support SSRMS based EVA contingency operations as specified in SSP 50005, paragraph 12.3.				
P-49	PTRS JSC 29789	3.2.1.5-E	A	EVA Interfaces Functional Requirements	All loose equipment and cargo operated on or by an EVA crewmember shall have attachment points or restraints so it can be secured or tethered at all times during transfer and at the worksite during EVA contingency operations as specified in SSP 50005, paragraph 12.3.				
P-50	PTRS JSC 29789	3.2.1.5-F	A	EVA Interfaces Functional Requirements	EVA worksites shall provide a force reaction mechanism independent of the robotic stabilization platform for forces greater than 10 lbf within 24 inches of the task site.				

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P-51	PTRS JSC 29789	3.2.1.5.1	A	<i>Extravehicular Activity Translation</i>	The ISS truss provides a translation path to each of the six PAS/UCCAS sites for contingency support of the ORUs at the interface and contingency operations involving the PAS/UCCAS. These translation paths allow for EVA contingency operations involving the PAS/UCCAS active half UMA, the three PAS/UCCAS guide vanes at each site, the PAS/UCCAS capture latch, the Attached Payload passive half UMA, and the Attached Payload EVA releasable capture bar. Attached Payloads shall provide for EVA translation for contingency operations.				
P-52	PTRS JSC 29789	3.2.1.5.2	A	<i>Payload Attach System/ Unpressurized Cargo Carrier Attach System Clearances</i>	Attached Payloads shall be designed not to violate the PAS/UCCAS EVA access envelopes as defined by SSP 57003, paragraph 3.1.3.1.1.3A to allow for attach site ORU removal and replacement.				
P-53	PTRS JSC 29789	3.2.1.5.3	A	<i>Extravehicular Activity Translation Corridor Protrusion</i>	Attached Payloads impinging on EVA translation corridors and worksites shall provide EVA fixtures serving the same functions as those obscured by the payload as specified in SSP 50005, paragraph 14.5.3.				
P-54	PTRS JSC 29789	3.2.1.6	A	<i>Micro-meteoroid and Orbital Debris (M/OD) Shields Functional Requirements</i>	The AMS-02 PIH shall provide protection from micrometeoroids and orbital debris for all safety critical elements of the AMS-02 Payload per paragraph 3.2.3.9 of this PTRS.				
P-55	PTRS JSC 29789	3.2.1.7	A	<i>Thermal Insulation Functional Requirements</i>	The AMS-02 PIH shall provide thermal insulation for safety critical elements of the AMS-02 Payload that require protection from thermal extremes to ensure safe operations.				
P-56	PTRS JSC 29789	3.2.2.1-A	A	<i>Weight/Center of Gravity (CG) – Weight</i>	Total weight of the PIH shall not exceed 3,828 lbs (1736 kg).				
P-57	PTRS JSC 29789	3.2.2.1-B	A	<i>Weight/Center of Gravity (CG) – CG</i>	Design of the PIH shall not cause the center of gravity (CG) of the AMS-02 Payload to exceed the maximum allowable CG offsets on the ISS. The maximum allowable offsets are: X +/- 32 inches, Y +/- 32 inches, Z between 0 and +75 inches				
P-58	PTRS JSC 29789	3.2.2.2	A	<i>Dimensions/ Volume</i>	The PIH shall not cause the AMS-02 Payload to exceed the operational envelope as defined in SSP 57003, Figure 3.1.3.1.1.1-1.				
P-59	PTRS JSC 29789	3.2.3.1	A	<i>Thermal</i>	The AMS-02 PIH shall meet the thermal requirements as specified in SSP 57003, Paragraph 3.5.1.2				

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P-60	PTRS JSC 29789	3.2.3.2	A	Pressure	The AMS-02 PIH shall meet the pressure requirements as specified in SSP 57003, paragraph 3.5.1.1				
P-61	PTRS JSC 29789	3.2.3.3	A	Vibration	The AMS-02 PIH shall meet the vibration requirements as specified in NSTS-21000-IDD-ISS, International Space Station Interface Definition Document, section 4.1.1.6, Vibration (paragraphs 4.1.1.6.1 & 4.1.1.6.2).				
P-62	PTRS JSC 29789	3.2.3.4-A	A	Acceleration – Flight & Ground Handling	The AMS-02 PIH shall be designed to show positive structural margins of safety during all flight and ground handling phases. Initial design load factors are listed in Table 3.2.4-1. These load factors may be superceded by the load factors from the official Verification Loads Analysis when the analysis is complete.				
P-63	PTRS JSC 29789	3.2.3.4-B	A	Acceleration – On-orbit	The AMS-02 PIH shall be designed to withstand an on-orbit acceleration environment including reboost having peak transient accelerations of up to 0.085 g's, a vector quantity acting in any direction.				
P-64	PTRS JSC 29789	3.2.3.4-C	A	Acceleration – Berthing	The AMS-02 PIH shall be designed to withstand berthing the Attached Payload in its berthing configuration having peak transient accelerations of up to 0.185 g's, a vector quantity acting in any direction. This criteria is to be used as a component load factor applied to the subsystem's center of gravity.				
P-65	PTRS JSC 29789	3.2.3.6	A	EMI/EMC	The AMS-02 PIH does not include any powered equipment, thus radiated electromagnetic interference (EMI) is not an issue. Cables that are part of the PIH shall be shielded if testing of the full AMS-02 Payload indicates that EMI shielding is necessary.				
P-66	PTRS JSC 29789	3.2.3.7.1	A	Transportation Humidity Environment	All components of the AMS-02 PIH shall operate satisfactorily after being exposed to non-condensing relative humidity ranges up to 95% and condensing relative humidity up to 100% during transportation.				
P-67	PTRS JSC 29789	3.2.3.7.2	A	Storage Humidity Environment	All components of the AMS-02 PIH shall operate satisfactorily after being exposed to an external environment of up to 75% relative humidity during storage.				
P-68	PTRS JSC 29789	3.2.3.7.3	A	Pre-Launch Humidity Environment	All components of the AMS-02 PIH shall operate satisfactorily after being exposed to an external environment of up to 55% relative humidity during pre-launch processing.				
P-69	PTRS JSC 29789	3.2.3.7.4	A	On-Orbit Humidity Environment	The AMS USS-02 will be exposed to an external environment of 0% relative humidity during on-orbit operations. This is to be used for design and analysis purposes.				

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P-70	PTRS JSC 29789	3.2.3.7.5	A	Orbiter Cabin Humidity Environment	The AMS DDRS-02 shall meet the humidity environments as defined in NSTS 2100-IDD-MDK specification.				
P-71	PTRS JSC 29789	3.2.3.8	A	Acoustic Emissions	The AMS-02 PIH does not have any components that produce acoustic emissions.				
P-72	PTRS JSC 29789	3.2.3.9	A	Micrometeoroids and Orbital Debris	The Attached Payload will be exposed to the MM/OD environments as specified in SSP 30425, paragraph 8.0. Parameters of ISS MM/OD environments definition are given in Table 3.2.3.9-1 and NASA TM 104825. This is to be used for design and analysis purposes. For the safety critical structures of AMS, this environment translates into a Probability of No Penetration (PNP) of 0.997. For non-safety critical AMS structures, a goal of 0.95 PNP has been established.				
P-73	PTRS JSC 29789	3.2.3.10	A	Atomic Oxygen	The AMS-02 PIH will be exposed to a flux of $5.0 \times 10^{21}$ atoms per $\text{cm}^2$ per year for the on-orbit exposure duration. This is to be used for design and analysis purposes. Silver plated hardware shall not be used per SSP 57003, paragraph 3.6.4.				
P-74	PTRS JSC 29789	3.2.3.11	A	External Contamination	The AMS-02 PIH will be exposed to on-orbit external contamination environments as defined in SSP 30426, External Contamination Control Requirements, paragraphs 3.4 and 3.5. This will be used for design and analysis purposes.				
P-75	PTRS JSC 29789	3.2.3.12.1	A	Ionizing Radiation Dose	The AMS-02 PIH shall be designed to not produce an unsafe condition or one that could cause damage to external equipment as a result of exposure to a total dose specified in SSP 30512, Space Station Ionizing Radiation Design Environment, paragraph 3.1.2.				
P-76	PTRS JSC 29789	3.2.3.12.2	A	Nominal Single Event Effects Ionizing Radiation	The AMS-02 PIH shall be designed to operate in and to not produce an unsafe condition or one that could cause damage to other equipment as a result of exposure to the radiation dose environment specified in SSP 30512, paragraph 3.2.1.				
P-77	PTRS JSC 29789	3.2.3.12.3	A	Extreme Single Event Effects	The AMS-02 PIH shall be designed to not produce an unsafe condition or one that could cause damage to external equipment as a result of exposure to extreme Single Event Effect (SEE) ionizing radiation assuming exposure levels specified in SSP 30512, paragraph 3.2.2.				
P-78	PTRS JSC 29789	3.2.4.1.2	A	Failure Tolerance Power and Data Interfaces	The AMS-02 PIH cabling for power and data interfaces shall be single fault tolerant.				

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P-79	PTRS JSC 29789	3.2.4.1.3	<i>A</i>	<i>Failure Tolerance O-ring Seals</i>	AMS-02 PIH Vacuum Case interfaces containing O-rings shall be two fault tolerant. (NOTE: The Payload Safety Review Panel has approved an equivalent fault tolerant approach for the two O-ring seal on the Vacuum case. The approach establishes a verification regimen for the two O-ring seal that would be equivalent to design, test and verification of a two fault tolerant system.)				
P-80	PTRS JSC 29789	3.2.4.2	<i>A</i>	<i>Failure Propagation</i>	A single failure of the AMS-02 PIH end item in a functional path shall not induce any other failures external to the failed end item.				
P-81	PTRS JSC 29789	3.2.6.1	<i>A</i>	<i>Ground Transportability</i>	The AMS-02 Payload and associated ground handling equipment (GHE) is being designed primarily for air transport. The Primary Support Stand (PSS) and Lower USS-02 Support Fixture are being designed specifically to be compatible with Boeing 747 cargo aircraft. Unassembled components of the AMS-02 PIH shall be designed to be compatible with transportation by truck.				
P-82	PTRS JSC 29789	3.2.6.2	<i>A</i>	<i>Transport to Orbit</i>	The AMS-02 payload shall be capable of being transported to orbit by the Orbiter in accordance with NSTS 21000-IDD-ISS. The AMS-02 payload will be transported in the Orbiter cargo bay. Design loads are defined in JSC 28792, AMS-02 Structural Verification Plan for the STS and the ISS.				
P-83	PTRS JSC 29789	3.3.1.1-A	<i>A</i>	<i>Materials and Processes</i>	Materials and processes for flight hardware shall meet the requirements of SSP 30233, "Space Station Requirements for Materials and Processes," as implemented by JSC 27301, "Material Control Plan for JSC Space Station GFE".				
P-84	PTRS JSC 29789	3.3.1.1-B	<i>A</i>	<i>Materials and Processes</i>	Materials and process for payloads shall meet the requirements of SE-M-0096, "General Specification for Materials and Processes for JSC Controlled Payloads".				
P-85	PTRS JSC 29789	3.3.1.1-F	<i>A</i>	<i>Materials and Processes</i>	Materials and processes shall meet the materials requirements of NSTS 1700.7B, section 209 and NSTS 1700.7B ISS Addendum 209.				
P-86	PTRS JSC 29789	3.3.1.1-G	<i>A</i>	<i>Materials and Processes</i>	Nonmetallic materials shall be selected to the maximum extent possible from JSC 09604, "JSC GFE Materials Selection List and Materials Documentation Procedures."				
P-87	PTRS JSC 29789	3.3.1.1-H	<i>A</i>	<i>Materials and Processes</i>	Selection of materials shall be approved by the Structural Mechanical Design and Analysis Branch (ES5) of the JSC Structures and Mechanics Division.				

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P-88	PTRS JSC 29789	3.3.1.2-A	A	<i>Electrical, Electronic and Electromechanical (EEE) Parts</i>	EEE parts for all Payload Integration Flight Hardware shall be selected in accordance with JSC 61360, "Engineering Directorate Certified Parts Approval Process (EDCPAP) and SSP 30312, Electrical, Electronic, and Electromechanical (EEE) and Mechanical Parts Management and Implementation Plan for Space Station Program.				
P-89	PTRS JSC 29789	3.3.1.2-B	A	<i>Electrical, Electronic and Electromechanical (EEE) Parts</i>	ESCG shall provide an as-built parts list and perform component stress analysis for all Payload Integration Hardware (PIH). EEE parts traceability to the serial and lot number will be provided for PIH. Parts shall be derated in accordance with SSP 30312, Electrical, Electronic, and Electromechanical (EEE) and Mechanical Parts Management and Implementation Plan for Space Station Program, Appendix B.				
P-90	PTRS JSC 29789	3.3.2	A	<i>Structural Design</i>	The AMS-02 PIH shall be designed to meet the structural design requirements of SSP 57003, paragraphs 3.1.1.7 and 3.1.1.8				
P-91	PTRS JSC 29789	3.3.3-A	A	<i>Nameplates and Product Marking</i>	Nameplates shall conform to the requirements of JSC-SPEC-M1B.				
P-92	PTRS JSC 29789	3.3.3-B	A	<i>Nameplates and Product Marking</i>	All other labels, decals, placards and product marking shall conform to the requirements of SSP 57003, paragraph 3.10.				
P-93	PTRS JSC 29789	3.3.4-A	A	<i>Workmanship</i>	Workmanship standards shall comply with NASA-STD-8739.3, "Soldered Electrical Connections"				
P-94	PTRS JSC 29789	3.3.4-B	A	<i>Workmanship</i>	Workmanship standards shall comply with NASA-STD-8739.4, "Crimping, Interconnecting Cables, Harnesses and Wiring"				
P-95	PTRS JSC 29789	3.3.4-C	A	<i>Workmanship</i>	Workmanship standards shall comply with IPC-6011, "Generic Performance Specification for Printed Boards"				
P-96	PTRS JSC 29789	3.3.4-D	A	<i>Workmanship</i>	Workmanship standards shall comply with IPC-6012A, "Qualification and Performance Specification for Rigid Printed Boards"				
P-97	PTRS JSC 29789	3.3.4-E	A	<i>Workmanship</i>	Workmanship standards shall comply with NASA-STD-8739.1, "Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies"				
P-98	PTRS JSC 29789	3.3.4-F	A	<i>Workmanship</i>	Workmanship standards shall comply with IPC-2221, "Generic Standard on Printed Board Design" and IPC-2222, "Sectional Design Standard for Rigid Organic Printed Boards"				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
P-99	PTRS JSC 29789	3.3.4-G	A	Workmanship	Workmanship standards shall comply with ANSI/ESD S20.20-1999, Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)				
P-100	PTRS JSC 29789	3.3.4-H	A	Workmanship	Workmanship standards shall comply with NASA-STD-8739.2, "Workmanship Standard for Surface Mount Technology"				
P-101	PTRS JSC 29789	3.3.4-I	A	Workmanship	Workmanship standards shall comply with NASA-STD-8739.5, "Fiber Optic Terminations, Cable Assemblies, and Installation"				
P-102	PTRS JSC 29789	3.3.4-J	A	Workmanship	The external surfaces of the AMS-02 Payload shall conform to Visibly Clean-Standard (VC-S) as specified in SN-C-0005, NSTS Contamination Control Requirements Manual.				
P-103	PTRS JSC 29789	3.3.5-A	A	Human Engineering	The AMS-02 Payload shall be designed to meet the requirements of SSP 57003, section 3.8.3, Human Engineering Design.				
P-104	PTRS JSC 29789	3.3.5-B	A	Human Engineering	The AMS-02 Payload shall be designed to meet the requirements of SSP 57003, section 3.8.4, Human Engineering Safety.				
P-105	PTRS JSC 29789	4.1	A	Packaging Levels and Methods	Packaging and packing shall be in general accordance with MIL-STD-2073-1D, "Standard Practice for Military Packaging."				
P-106	PTRS JSC 29789	4.3	A	Military Transportation Procedures Documentation and Reports	Shipments entered into the military airlift system shall be documented and reported in accordance with DODR-4500.32R, "Military Standard Transportation and Movement Procedures."				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
R-1	SSP 57000	2.1	A	Documentation	In the event of a conflict between the documents referenced heron and the contents of this specification, the contents of this document shall be considered a superseding document.	Completed CRs to address how conflicts in documentation are resolved.			
R-2	IRD SSP 57003	3.1.1.4	NA	Operational Lifetime	The PAS/UCCAS interface will have an operation lifetime of the maximum expected on-orbit life plus 2 years given periodic inspections, preventative and corrective maintenance, restoration, replacement of components, and re-supply operations.				
R-3	IRD SSP 57003	3.1.2	NA	Structural/Mechanical Interface with the Mobile Servicing System	The mechanical interface between the attached payload and the MCAS, physically similar to the interface with the payload attach system/unpressurized cargo carrier attach system sites, must meet the requirements defined in SSP 42004, Mobile Servicing System to User (generic) ICD parts 1&2, section B3	Do we need verifications to show compliance with SSP 42002?			<b>Fitcheck should be used as verification.</b>
R-4	IRD SSP 57003	3.7.6.3	A	EBCS Thermal Requirements	A) Non - operational on-orbit - TBD B) Operational on-orbit - TBD	TBD			SVMs are TBD
R-5	IRD SSP 57003	4. 0	A	Verification	Statements in this document using the word "shall" shall be verified.	a) Plans and milestones for verifying compliance with the requirements in this document.			
R-6	IRD SSP 57003	4. 0	A	Verification	B) If development test data is intended to be used to qualify hardware, its intent shall be pre declared C) Environmental models shall be used to represent environments that cannot be under the conditions of ground testing D) Integration testing and checkout shall be conducted attached payload buildup. Activities such as continuity checking and interface mating shall be performed at that time. F) Hardware shall be inspected and certified that design drawings, waivers, engineering CRs, etc reflect the as-built hardware.	b) Identification/ of development testing used to qualify hardware c) Identification and validation of environmental models d) Development and implementation of test plans to assure integration testing/checkout are conducted during attached payload buildup that include activities such as electrical continuity/interface mating verification. f) Accepted and approved attached payload certification data package			
R-7	IRD SSP 57003	4.1	A	Verification General	a) Compliance with the requirements state in section 3 shall be proven using one or more of the following methods: Inspection, Analysis, Similarity Analysis, Demonstration, and Test. b) Test shall be selected as the primary method when analytical techniques do not produce	a,b, & c) Development and implementation of certification package to demonstrate compliance to requirements in section 3 using Inspection, Analysis, Similarity Analysis, Demonstration, and Test.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					adequate results; failure modes exist which could compromise personal safety, adversely affect flight systems or payload operations, or result in a loss of mission objectives; or for any components directly associated with Orbiter or ISS interfaces  c) Test shall be used to determine qualitative compliance to requirements and produce qualitative results.	Testing ( that demonstrates qualitative results) is the primary means when analysis does not produce adequate results.  c) Development and implementation of certification package to demonstrate compliance to requirements in section 3 using Inspection, Analysis, Similarity Analysis, Demonstration, and Test. Testing ( that demonstrates qualitative results) is the primary means when analysis does not produce adequate results.			
R-8	IRD SSP 57003	3.1.1 4.3.1.1	A	General Design Requirements	All payload hardware design drawings, exceedances, deviations, waivers, and engineering change requests shall reflect the as-built hardware.	Certificate of conformance with TPS data references to demonstrate successful completion of inspection results assure certification of the attached payload design reflects as-built hardware.	I		
					AP hardware shall be inspected and certified that design drawings, exceedances, deviations, waivers, and ECRs reflect as-built hardware. Verification shall be considered successful when the inspection results in the certification of the design drawings, exceedances, deviations, waivers, and ECRs reflect as-built hardware.	<b>Certificate of conformance with TPS data references to demonstrate successful completion of inspection results assure certification of the attached payload design reflects as-built hardware.</b>			
9	IRD SSP 57003	3.1.1.1 4.3.1.1.1	A	Fail safe, Safe-life, or Low risk Fracture parts	AP structure shall be designed to be fail safe, safe life, or be low risk fracture critical part in accordance with SSP 52005. An analysis shall be performed using test or analysis data in accordance with SSP 52005, section 5.3.2.	a) Fail safe/safe-life/low risk analysis in accordance with SSP 52005, section 5.3.2 to verify the primary structure has a +0.00 or positive safety margins with respect to the loads used in the component/material analysis during ascent, on-orbit, and descent.	A		
					When it is shown that attached payload structural components and materials can be classified as fail safe, safe-life, or low risk and the primary structure has a +0.00 or positive safety margins with respect to the loads used in the component/material analysis during ascent, on-orbit, and decent, then the verification shall be considered complete.				
10	IRD SSP 57003	3.1.1.2 4.3.1.1.2	A - 57003 NA-57213	Fracture Control	APs shall meet the fracture control requirements for on-orbit interfaces with a PAS/UCCAS site in accordance with SSP 52005, Sect. 5.3.	a) Summary of activities in accordance with SSP 52005, section 7.5 that references NDE inspection activities. <b>b) Manufacturing documentation in</b>	I?		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Verification of this requirement shall be by performance of NDE inspection as required by SSP 52005 ,section 7.5.	<b>ADP showing JSC review, inspection and acceptance of attached payload structure. C.) JSC acceptance of attached payload structural analyses that AP FCP.</b>			
11	IRD SSP 57003	3.1.1.3 4.3.1.1.3	A	MOD Protection for External payloads	An AP that is a stored energy device or contains hardware that can create a catastrophic hazard if impacted by MMOD shall be designed to SSP 52005, para.5.1.5 and NASA TM 104825.	a1)M/OD analysis and inspection summaries to address design drawing against hardware to identify attached payload stored energy devices and/or hardware that can create a catastrophic hazard in accordance with SSP 52005, para. 5.1.5. a2) Identification of hardware with MMOD hazard potential. a3) Detail of MMOD Design attributes a4)MMOD shield Testing b) JSC approval of MMOD approach	A		
					An inspection shall be performed of the design drawings to identify any stored energy devices or hardware that could create a catastrophic hazard if impacted or penetrated any a meteoroid or orbital debris. An analysis shall be performed on M/OD critical components or subcomponents to verify that the hardware meets SSP 52005, para 5.1.5. Verification shall be considered successful when the analysis shows the requirements of SSP 52005 are satisfied.				
12	IRD SSP 57003	3.1.1.2.1 4.3.1.1.2.1	A	Margins of Safety	APs shall provide margins of safety when exposed to crew induced and on-orbit loads in accordance with SSP 52005, section 5.2. An inspection of structural analysis reports shall be performed to verify that positive margins of safety exist for all attached payload structural components. When it is shown that all attached payload structural components have positive margins of safety for the specified combined loads conditions, the verification shall be satisfied.	a) Development and submittal structural analysis reports to verify positive margins of safety for attached payload structural components including specified combined load conditions. b) JSC review, inspection and acceptance of attached payload structural analyses that demonstrate positive margins of safety including specific combined load conditions.	I		
13	IRD SSP 57003	3.1.1.2.2 4.3.1.1.2.2	A	Factor's of Safety	Safety factors for attached payload structural design shall be in accordance with SSP 52005, section 5.1. An inspection of structural analysis reports shall be performed to verify that specified factors of safety have been used in the analyses of the structure. When it is shown that the attached	a) Development and submittal structural analysis reports to verify positive factors of safety for attached payload structural components including specified combined load conditions. b) JSC review, inspection and	I-DLA, VLA in accordance with 52005		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					payload structural components have a +0.00 or positive margin of safety for the specified combined loads conditions, the verification shall be considered satisfied.	acceptance of attached payload structural analyses that demonstrate positive factors of safety including specific combined load conditions.			
14	IRD SSP 57003	3.1.1.2.3 4.3.1.1.2.3	A	Design Loads	<p>A) The PAS//UCCAS interface shall be designed in accordance with SSP 30559, para. 3.2 and IRD SSP 57003 and the interfaces loads in Table 3.1.1.2.3-2 combined with the preload defined in 3.1.3.1.3.1 and thermal loads derived from para. 3.5.1.12.</p> <p>AP structure and systems shall be designed in accordance with SSP 30559, para 3.2 and loads referenced in IRD SSP 57003 Table 3.1.1.2.3-1. Analysis shall be performed to verify that the attached payload is designed in accordance with the loads specified in para. 3.1.1.2.3. The requirement shall be considered successfully verified when the structural components have been shown by test or analysis to have positive margins of safety for the design loads specified in paragraph 3.1.1.2.3 in accordance with 30559, para 3.2</p>	<p>a1) Development and submittal attached payload structural analysis reports to verify design loads positive margins of safety in accordance with 30559, para 3.2 and IRD SSP 57003 3.1.1.2.3.</p> <p>b5) JSC review, inspection and acceptance of loads analysis, testing, and models demonstrate attached payload design loads. (JSC Approval of AMS Structural Verification plan, Thermal assessment, Interface Preload Assessment</p>	A&T	CofC	
					<p>B) When the payload is coupled to the ISS attachment structure, the AP/UCC interface loads shall not exceed those specified in IRD SSP 57003 Table 3.1.1.2.3-2 as derived to envelope the AP/UCC mass/cg limits defined in IRD SSP 57003 para. 3.1.3.1.2.2 (SSP 52005, para. 5.1) The PAS//UCCAS interface shall be designed to withstand the interfaces loads in IRD SSP 57003 Table 3.1.1.2.3-2 (Latch Engaged) combined with the preload defined in IRD SSP 57003 para. 3.1.3.1.3.1 and thermal loads derived from IRD SSP 57003 para. 3.5.1.12.</p>	<p>b2) Development and submittal of Payload developed dynamic math model in accordance with D684-10091-1, para.4.5</p> <p>b3) Payload structural testing to verify design loads demonstrate payload does not induce loads greater than those in Table 3.1.1.2.3-2.</p>			
					<p>Verifications shall be by analysis or analysis and test. For an integrated on-orbit analysis, an integrated space station model shall be coupled with a payload dynamic math model provided by the payload development in accordance with D684-10091-1, para.4.5. The payload model shall be test-correlated in accordance with D684-10091-1, para.3.3.1. Verification shall be considered successful when the analysis or test assessment shows that the payload does not induce loads greater than those in Table 3.1.1.2.3-2.</p>	<p>b3) Test correlated payload model in accordance with D684-10091-1, para.3.3.1</p> <p>b4) Integrated on-orbit analysis that includes ISS model in accordance with D684-10091, para. 4.5</p> <p>b5) JSC review, inspection and acceptance of loads analysis, testing, and models demonstrate attached payload design loads. (JSC Approval of AMS Structural Verification plan, Thermal assessment, Interface Preload</p>			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						Assessment			
15	IRD SSP 57003	3.1.1.2.4.2 4.3.1.1.2.4.1	A	Guide Pin Contact Forces	APs shall withstand berthing contact forces at guide pins based on a robotic installation approach speed of 0.1 ft/second. An analysis shall be performed to verify that the attached payload can withstand the berthing contact forces specified. Verification shall be successful when the analysis shows the requirements in para 3.1.1.2.4.1 have been met.	a) Development and submittal guide pin analysis reports to verify attached payload can withstand the berthing contact forces specified in para 3.1.1.2.4.1 a2) Analysis and Tests to demonstrate that forces on guide pin 1,2 and ,3 are less than those identified in IRD SSP 57003 Table 3.1.1.2.4.1-1( -535 to 757 #s) b) JSC review, inspection and acceptance of attached payload guide pin analyses reports in accordance with para. 3.1.1.2.4.1.	A	CofC	
16	IRD SSP 57003	3.1.1.2.4.1 4.3.1.1.2.4.2	A	Capture Bar Contact Forces	AP capture bar shall withstand the maximum berthing contact forces as defined in table 3.1.1.2.4.2-1. An analysis shall be performed to verify that the attached payload can withstand the berthing contact forces specified. Verification shall be successful when the analysis shows the requirements in para 3.1.1.2.4.2 have been met.	a) Development and submittal guide pin analysis reports to verify attached payload can withstand the berthing contact forces specified in para 3.1.1.2.4.2 a2) Analysis and Tests to demonstrate that forces on capture bar contact forces are lower than Fx +/- 526, Fy +/- 233, and Fz 539 b) JSC review, inspection and acceptance of AP analyses reports in accordance with para. 3.1.1.2.4.2.	A	CofC	
17	IRD SSP 57003	3.1.1.2.5 4.3.1.1.2.5	A	Thermal Effects	AP structure shall meet the interface requirements when subjected to structural interface temperatures ranging from -120 F when combined with static and dynamic loading. Verification of attached payload structure for thermal effects combined with induced static and dynamic loads shall be performed by analysis.	a1. Thermal vacuum testing summary a2) Integrated Thermal analysis of worst case cold and hot thermal environments a3) Thermal model verification assessment a4) Structural verification plan to JSC a5) Correlation of thermal analysis and test results a6) Use and verification of passive thermal control (MLI) a7) Verification of active thermal control designs a8) Development and submittal of analysis that addresses combined loads from thermal effects, induced static and dynamic, mechanical on-orbit interfaces, and thermally induced effects in accordance with SD77-SH-0214 (para 2.1.9), IRD SSP 57003 (table 2.3.1.1.2.3-1 and para. 3.4 to	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						demonstrate attached payload structure and structural components have a +0.00 or + margins of safety. b) JSC review, inspection and acceptance of attached payload analyses reports that assures attached payload structure and structural components have a +0.00 or + margins of safety.			
					For on-orbit flight, the analysis shall impose thermally induced on orbit interface loads specified in SD77-SH-0214 and Identification System , para 2.1.9 (quasistatic Models and deflection data management/Control System), mechanically induced on orbit interface loads specified in table 23.1.1.2.3-1, and thermally induced effects defined in 3.4. The attached payload structure shall be considered successfully verified for thermal effects combined with static and dynamic loading when the structure and structural components have a +0.00 or + margins of Safety.	a8) Development and submittal of analysis that addresses combined loads from thermal effects, induced static and dynamic, mechanical on-orbit interfaces, and thermally induced effects in accordance with SD77-SH-0214 (para 2.1.9), IRD SSP 57003 (table 2.3.1.1.2.3-1 and para. 3.4 to demonstrate attached payload structure and structural components have a +0.00 or + margins of safety. b) JSC review, inspection and acceptance of attached payload analyses reports that assures attached payload structure and structural components have a +0.00 or + margins of safety.			
18	IRD SSP 57003	3.1.1.2.6 4.3.1.1.2.6	A	EVA On-orbit Induced loads	External components of AP hardware which will have a crew or crew actuated tool interface's) shall withstand the loads defined in IRD SSP 57003 Tables 3.1.1.2.6-1 and 3.1.1.2.6-2Verification shall be by analysis. The analysis shall show that the attached payload is capable of reacting to loads defined in tables 3.1.1.2.6-1 and 3.1.1.2.6-2. Verification shall be considered successful when the analysis shows that the attached payload is capable of withstanding the specified loads.	a1) Development and submittal of analysis that demonstrate the attached payload is capable of reacting to induced loads defined in tables 3.1.1.2.6-1 and 3.1.1.2.6-2 and show +0.00 or + margins of safety. Testing, inspection, analysis and training to verify	A	CofC	
						a2) Analysis to demonstrate EVA handling loads and margins (45#), EVA kick loads and margins(200#), Inadvertent kick/tool impact (125#) loads margins, PFR margins(274# in sheer), tool tether margins(75#), Tool design fine/gross motor activity, EVA mechanical resistive forces, EVA covers load margins(25#), EVA Connectors, Mounting Hardware			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						margins(35 #), and high torque fasteners margins (25#/100#). b) JSC review, inspection and acceptance of attached payload analyses that assures EVA on-orbit induced loads have a +0.00 or + margins of safety based on induced loads defined in tables 3.1.1.2.6-1 and 3.1.1.2.6-2.			
19	IRD SSP 57003	3.1.1.3 4.3.1.1.3	A	Design service Life	The design service life of the PAS/UCCAS shall have a maximum expected on-orbit life plus 2 years. A review of the structural analysis reports shall be performed to verify that the analyses are in conformance with the specified requirements for all structural components. When it is shown that AP structural components satisfy the maximum expected design life in paragraph 3.1.1.3 and have been analyzed in conformance with the requirements as specified in SSP 30559, paragraph 3.5, then the verification shall be satisfied.	a1) Development, and submittal of analysis that demonstrate attached payload structural components satisfy the maximum expected design life in accordance with SSP 30559, paragraph 3.1.1.3. a2) Structural verification plan to define life plus 2 years a3) Structural interface testing to show margins on design life a4) Structural modeling to correlate testing and analysis efforts.	I	CofC	
						a5)Definition of limited life items based on life plus 2 years a6) Fracture Control plan a7) Thermal analysis to define worst case expected environments for life plus 2 years a8) Definition of EVA provisions used extend life of interfaces b) JSC review, inspection and acceptance of attached payload structural components satisfy the maximum expected design life in accordance with SSP 30559, paragraph 3.1.1.3.			
20	IRD SSP 57003	3.1.1.5 4.3.1.1.5	A	Interchangeability	APs shall be compatible with contingency installation and safety related operations on any one of the six PAS/UCCAS site locations. An analysis shall be performed using Attached Payload design drawings to verify that the Attached Payload configuration is compatible with installation on any of the six truss attach sites.	a1) Development, and submittal of analysis that demonstrate attached payload configuration (including considerations for maximum/ minimum tolerance stackup) to show safe operations are compatible with installation on any of the six truss attach sites.	A	CofC	
					The verification shall be considered successful when analysis including maximum and minimum tolerance stickup shows that the	a2) EVA operational hazard assessment to define hazards and controls at all six PAS/UCCAS site locations			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Attached Payload is installable and capable of safe operations at any of the truss attach sites.				
						a3) Contingency procedures definitions and procedures. b) JSC review, inspection and acceptance of attached payload configuration (including considerations for maximum/ minimum tolerance stackup) to show safe operations are compatible with installation on any of the six truss attach sites.			
21	IRD SSP 57003	3.1.1.6 4.3.1.1.6	A	Attached Payload Durability	APS shall withstand a minimum of 6 combined mate and demate cycles per year combined with the MCAS, PAS, and UCCAS attached sites. An analysis shall be performed using mate and demate mechanism test data, item structural data, and material and parts data to verify interface durability.	a1) Development, and submittal of analysis that demonstrate attached payload mate/demate mechanism test data, item structural data, and material and parts data to verify interface durability to ISS performs its intended function following the number of mate/demate cycles specified in paragraph 3.1.1.6. a2) Design life analysis of connectors to assure durability for 6 combined cycles plus the cycles during MCAS, PAS, or UCCAS sites for connector mate/demate.	A	CofC	
					The verification shall be considered successful when the analysis shows that the on orbit AP interface to ISS will perform its intended function following the number of mate and demate cycles specified in paragraph 3.1.1.6.	a3) Identification of all connectors to be mated/demated with analysis and/or tests to demonstrate connector durability in all environments. b) JSC review, inspection and acceptance of attached payload configuration to assure that demonstrate AP mate/demate mechanism test data, item structural data, and material and parts data to verify interface durability to ISS performs its intended function following the number of mate/ demate cycles specified in paragraph 3.1.1.6.			
22	IRD SSP 57003	3.1.1.7 4.3.1.1.7	A	Structural Materials Criteria and Selection	A. Mechanical properties of attached payload structural materials shall be in accordance with MIL-HDBK-5 "Metallic Materials and Elements for Aerospace Vehicle Structures. Mechanical properties of attached payload structural materials shall be in accordance with MIL-HDBK-17 "Polymer Matrix Composites Vol. 1 Guidelines.	a1) Development, and submittal of inspection results that demonstrate attached payload structure production drawings to verify that materials are selected which meet the criteria as specified in paragraph 3.1.1.7 and selected as specified in NSTS 1700.7, ISS Addendum, paragraph 208.3.	I & I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						a2) Non-Metallic material list comparing AMS structural materials to requirements of MIL-HDBK-17.			
					An inspection shall be performed of the Attached Payload structure production drawings to verify that materials have been selected which meet the criteria as specified in paragraph 3.1.1.7. Verification will be considered successful when the inspection shows that the structural material selection is in accordance with the requirements.	a3) Damage prevention plan for nonmetallic materials used in structural applications a4) Coupon testing of non-metallic materials used in structural applications A.2.d. Verification to assure that fabrication is completed per design drawings a5) Thermal analysis to demonstrate structural capabilities due to thermal cycling over lifespan of non-metallic structure.			
					B. Structural materials section shall be in accordance with NSTS 1700.7, ISS Addendum paragraph 208.3An inspection shall be performed of the Attached Payload structure production drawings to verify that materials have been selected which meet the criteria as specified in NSTS 1700.7, ISS Addendum, paragraph 208.3. Verification will be considered successful when the inspection shows that the mechanical properties are in accordance with the requirements.	b1) Materials selected per MSFC-HDBK- 527. b2) Metallic material list comparing AMS structural materials to requirements of MIL-HDBK-5.			
						c) JSC review, inspection and acceptance of attached payload structure production drawings to verify that materials are selected which meet the criteria as specified in paragraph 3.1.1.7 and selected as specified in NSTS 1700.7, ISS Addendum, para. 208.3.			
23	IRD SSP 57003	3.1.1.8 4.3.1.1.8	A	Structural Degradation from Material Erosion	Potential structural erosion, e.g. plasma environmental effects compatibility-induced, atomic oxygen (AO) during the design life and exposure to the environment as defined in SSP 30425 "Space Station Program Natural Environment definition for Design", shall be included in the design and analysis of the attached payload structure.	a1) Development, and submittal of analysis that demonstrate attached payload structural analysis reports performed verify potential structural erosion effects demonstrate positive margins of safety for required combined loads conditions as specified in SSP 30425. a2) PNP analysis	I	CofC	
					A review of the structural analysis reports shall be performed to verify that potential structural erosion effects have been included in the	a3) MMOD testing and life assessment b) JSC review, inspection and acceptance of attached payload			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					analysis of the structure. When it is shown that Attached Payload structural components have a positive margin of safety for the required combined loads conditions, as specified in SSP 30425, then the verification shall be satisfied.	structural analysis reports to verify structural erosion effects demonstrate positive margins of safety for required combined loads conditions as specified in SSP 30425.			
24	IRD SSP 57003	3.1.2.1 4.3.1.2.1	A	Structural Design Interface	APs shall structurally interface with the MCAS as specified in SSP 42004, para. B3.2.2.3 An analysis shall verify that the APs structural interface with the MCAS meets the requirements of SSP 42004. Verification shall be considered successful when the analysis shows that the requirements of SSP 42004 are met.	a) Development, and submittal of analysis that demonstrate attached payload structural interface with the MCAS meets the requirements of SSP 42004. b) JSC review, inspection and acceptance of attached payload structural interface with the MCAS meets the requirements of SSP 42004.	A - FEM, DCLA,VCLA		
25	IRD SSP 57003	3.1.2.2 4.3.1.2.2	A	Mechanical Design Interface	The AP shall mechanically interface with the MCAS as specified in SSP 42004, para. B3.2.2.2	a) Development, submittal and assessment of drawings and test results that demonstrate attached payload drawings and test with a flight-like test article that the mechanical attach points are compatible with the MCAS as specified in SSP 42004.	I&T	CofC	<b>Criteria should be successful fitcheck with flight unit.</b>
					Verify by inspection of the AP drawings and test with a flight-like test article that the mechanical attach points are compatible with the MCAS as specified in SSP 42004. Verification shall be considered successful when the inspection and test confirm compatibility.	b) JSC review, inspection and acceptance of attached payload drawings and test results that demonstrate attached payload drawings and test with a flight-like test article that the mechanical attach points are compatible with the MCAS as specified in SSP 42004.			<b>Criteria should be successful fitcheck with flight unit.</b>
26	IRD SSP 57003	3.1.2.3 4.3.1.2.3	A	Mass and Envelope Dimensions	A. The total mass of the AP (facility carrier and payload experiments) to be attached at the MCAS by the mobile transporter along the ISS truss shall not exceed 19000 lbs. ( Note: The capability of the MCAS is reduced to 10000 lbs. during Russian dockings The verification shall be by test. Determine the actual weight of the Attached Payload weight by test, including any stowage items and any AP provided ancillary equipment. Verification shall be considered successful when the tests show the actual mass to be no greater than the control mass specified in 3.1.2.3.	a1) Development, submittal, and completion of tests that demonstrate attached payload actual weight/mass, including any stowage items/ancillary equipment are no greater than the control mass specified in 3.1.2.3. a2) JSC review, inspection and acceptance of attached payload tests that demonstrate attached payload actual weight/mass, including any stowage items/ancillary equipment are no greater than the control mass specified in 3.1.2.3.	I&T - 57213 Exception E1 ( interface Loads_	CofC	
						a3. Operational control to address mass during Russian docking. a4) Dimension review against drawings and ICD			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. The AP (facility carrier and payload experiments) shall not exceed the MCAS user envelope dimensions of SSP 42004, para. B3.2.2.1. The verification shall be by inspection of design drawings. Verification shall be considered successful when the inspection shows that the Attached Payload on-orbit configuration translation envelope does not exceed the dimensions specified in SSP 42004, paragraph B3.2.2.1.	b1) Form/fit/function test prior to installation into SSP b2) Analysis to define tolerances as compared to ISS drawings b3) Fit check of hardware in MCAS qualification hardware.			
						b4) Development, submittal, and summary of design drawing inspections that assure attached payload on-orbit configuration translation envelope does not exceed the dimensions specified in SSP 42004, paragraph B3.2.2.1. c) JSC review, inspection and acceptance of attached payload design drawing inspections that assure attached payload on-orbit configuration translation envelope does not exceed the dimensions specified in SSP 42004, paragraph B3.2.2.1.			
27	IRD SSP 57003	3.1.3.1.1.1 4.3.1.3.1.1.1	A	PAS/UCCAS on-orbit Operational envelope	APs and equipment shall be designed such that the payload does not exceed the allowable on-orbit operational envelope in accordance with Figure 3.1.3.1.1.1-1 (this envelope includes distortions due to thermal environments and allocates clearance for S3/P3 secondary translation paths when the attached payload is in the berthed position)	a) Development, and submittal of inspection results that demonstrate attached payload the maximum dimensions of the Attached Payload fit within the specified envelope specified in paragraph 3.1.3.1.1.1. b) Verification that on-orbit operational envelope meets NSTS 21000 for the payload bay c) Verification that critical interface dimensions are in compliance with SSP 57000, figure 3.1.2.2-1 (takes precedence when there are conflicts)	I - 57213 Exception E2	CofC	
					Verification shall be by inspection of design drawings. Inspection shall show that the maximum dimensions of the AP fit within the specified envelope. Verification shall be considered successful when the inspection shows that the Attached Payload installation configuration fits within the envelope specified in paragraph 3.1.3.1.1.1.	d) JSC review, inspection and acceptance of attached payload the maximum dimensions of the Attached Payload fit within the specified envelope as defined in paragraph 3.1.3.1.1.1.			
28	IRD SSP 57003	3.1.3.1.1.2 4.3.1.3.1.1.2	A	Interface Plan Protrusion	Verification shall be by inspection of design drawings. The inspection shall show that the Attached	a) Development, and submittal of inspection results that demonstrate attached payload design drawings show	I - 57213 Exception E3		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Payload on-orbit installed configuration does not include a structural, mechanical, utility or ORU component that would extend into the PAS/UCCAS active side of the interface plane, except for a capture bar and keel trunion.	Attached Payload on-orbit installed configuration does not include a structural, mechanical, utility or ORU component that would extend into the PAS/UCCAS active side of the interface plane (except for a capture bar and keel trunion) does not include protrusions into the PAS/UCCAS side of the datum plane as specified in paragraph 3.1.3.1.1.2. and SSP 57007, figure 3.1.3.1.2.1-1.			
					Verification shall be considered successful when the inspection shows that the Attached Payload installation does not include protrusions into the PAS/UCCAS side of the datum plane as specified in paragraph 3.1.3.1.1.2.	b) JSC review and acceptance of attached payload inspection results to verify design drawings for on-orbit installed configuration does not include protrusions into the PAS/UCCAS side of the datum plane as specified in paragraph 3.1.3.1.1.2.			
29	IRD SSP 57003	3.1.3.1.1.3 4.3.1.3.1.1.3	A	EVA/Robotics Envelope	APs shall be designed to ensure that no structural, mechanical, utility, or ORU component protrudes past the PAS/UCCAS interface plane as defined by the X/Y plane in figure 3.1.3.1.2.1-1, except for the capture bars and envelope for the attached payload trunion.	a1) Development, and submittal of inspection summary of design drawings demonstrate EVA translation corridor/accessibility is maintained between the AP and other ISS equipment in accordance with specified envelope in the unique ICD and EVR translation corridor/accessibility are maintained around the operational/deployed AP and other ISS operations and the installation/removal on adjacent PAS/UCCAS sites specified envelope in 3.1.3.1.1.3 and SSP 50005, para 14.5	I - 57213 Exception E4/5		
					A. EVA translation corridor and accessibility shall be maintained between the AP and other ISS equipment, including attached payloads or other installations on adjacent PAS/UCCAS sites in accordance with SSP 50005, ISS Flight Crew Integration Standard (NASA STD 3000/T) document, para. 14.5 Verification shall be by inspection of design drawings. The inspection shall show that the EVA translation corridor and accessibility is maintained between the Attached Payload and other ISS equipment. Verification shall be considered successful when the inspection shows that the Attached Payload meets the specified envelope in the unique ICD.	a2) Design review against hardware and drawings to substantiate attached PL hardware and other ISS equipment do not protrude into the EVA envelope a3) Analysis to demonstrate that robotic corridor is maintained per SSP 41162, para. 3.2.2.7			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Robotic translation corridor and accessibility shall be maintained around the operational/deployed attached payload for ISS operations and the installation/removal of attached payloads or other installations on adjacent PAS/UCCAS sites in accordance with SSP 41162, para.3.2.2.7..	a4) Design review against hardware and drawings to substantiate AP hardware and other ISS equipment do not protrude into the robotic envelope.			
					Verification shall be by inspection of design drawings. The inspection shall show that the EVR translation corridor and accessibility shall be maintained around the operational/deployed AP and other ISS operations and the installation/removal on adjacent PAS/UCCAS sites. Verification shall be considered successful when the inspection shows that the Attached Payload meets the specified envelope in 3.1.3.1.1.3B	b) JSC review, inspection and acceptance of AP inspection summary of design drawings demonstrate EVA translation corridor/accessibility is maintained between the AP and other ISS equipment in accordance with specified envelope in the unique ICD and EVR translation corridor/accessibility are maintained around the operational/deployed AP and other ISS operations and the installation/removal on adjacent PAS/UCCAS sites specified envelope in 3.1.3.1.1.3.			
30	IRD SSP 57003	3.1.3.1.2.1 4.3.1.3.1.2.1	A	PAS Coordinate System Origin Location	AP shall use the PAS local coordinate system origin location defined in figure 3.1.3.1.2.1-1. Verification shall be by inspection. The inspection shall show that all analysis for the Attached Payload is in compliance with the convention established in Figure 3.1.3.1.2.1-1. Verification shall be considered successful when the inspection shows that all analysis for the Attached Payload uses the proper convention.	a) Development, and submittal of inspection summary that demonstrates all attached payload analysis is in compliance with the convention established in Figure 3.1.3.1.2.1-1. b) JSC review and acceptance of inspection summary that demonstrates all attached payload analysis is in compliance with the convention established in Figure 3.1.3.1.2.1-1.	I	CofC	
31	IRD SSP 57003	3.1.3.1.2.2. 4.3.1.3.1.2.2	A	Mass and Center of Gravity	For APs between masses of 3000 lbs. And 19000 lbs. , the allowable center of gravity offsets shall be as follows: A. 3000 lbs: X+/- 32 inches, Y +/- 32 inches, Z between 0 and +100 inches B. 19000 lbs: X+/- 32 inches, Y +/- 32 inches, Z between 0 and +66 inches Determine the actual weight of the AP by analysis based on test data, including any stowage items and any PD-provided ancillary equipment that takes into account allowable tolerance of + 5.0 lbs or 0.3%, whichever is greater. Determine the actual CG by analysis based on test data of the AP in three orthogonal axes. Allowable tolerance shall be ±0.25 in. in all	a1) Development of testing and testing results summary to demonstrate actual weight of PD-provided ancillary equipment that includes allowable tolerance shall be + 5.0 lbs or 0.3%, whichever is greater.	A		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					three axes. Verification shall be by analysis. The analysis shall show the Attached Payload CG accounts for articulating and/or dynamic payload operations. Verification shall be considered to be successful when the analysis shows the requirements have been met.				
						a2) Development of analysis and analysis summary to identify the actual CG based on attached payload test data in three orthogonal axes with allowable tolerance shall be $\pm 0.25$ in. in all three axes. a3) Development, and submittal of analysis that identify attached payload actual weight and CG that accounts for articulating and/or dynamic payload operations with tolerances of $\pm 5.0$ lbs/ 0.3% and $\pm 0.25$ in. in all three axes, respectively.			
						a3) Review of Design to assure weight and CG is within 32 " in XY axis and 0-100" in Z axis b1) Review of Design to assure weight and CG is within 32 " in XY axis and 0-66" b2) JSC review, inspection and acceptance of attached payload weight and CG analysis and tests to assure actual payload weight and CG is $\pm 5.0$ lbs/ 0.3% and $\pm 0.25$ in. in all three axes, respectively.			
32	IRD SSP 57003	4.3.13.1.3	A	Attached Payload Fundamental Frequency	The AP shall exhibit a minimum fundamental frequency of 1.5 hz or greater when rigidly fixed in all 6 degrees of freedom at the PAS/UCCAS interface points as defined in 3.13.1.3.2 (Interface stiffness).	a1) Development, and submittal of analysis and or dynamic testing (modal survey or vibration tests) results that identify attached payload minimum fundamental frequency is . a2) Development and submittal of fundamental frequency analysis using guidelines provided in accordance with SSP 52005, Appendix C.1.2.2	A or T, FEM or Cert. Data		
					The AP minimum fundamental frequency shall be determined by analysis or by dynamic testing (model survey or vibration test). Analysis shall be performed using the guidelines provided in accordance with SSP 52005, Appendix C.1.2.2, and a Finite Element Model (FEM) that has been developed in	a3) Development and submittal of FEM that demonstrate attached payload in accordance with SSP 52005, paragraphs 6.1.1.2, 6.1.1.3 and 7.1. b) JSC review, inspection and acceptance of attached payload FEM, dynamic test results, and other			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					accordance with SSP 52005, paragraphs 6.1.1.2, 6.1.1.3 and 7.1. Verification shall be considered successful when the analysis or test shows the Attached Payload meets the requirements of paragraph 3.1.3.1.3.	frequency analysis that assure requirements of paragraph 3.1.3.1.3 are met.			
33	IRD SSP 57003	3.1.3.1.1.3 4..3.1.3.1.3.1	A	Interface Preload	AP hardware when mounted on a simulated CAS active half, is capable of achieving a nominal preload of 5650 lbs $\pm$ 5% applied to the payload passive PAS by the CLA. The AP shall be capable of providing a minimum and maximum loading in the -Z direction of 4900 lbs. And 6430 lbs. Respectively. The AP shall be capable of providing a minimum and maximum loading in the -Z direction of 4900 lbs. Verification shall be by analysis and test. The analysis and strength test shall show that the AP hardware will withstand a maximum preload of 6430 lbs from the PAS/UCCAS capture latch.	a1) Development and submittal of analysis that demonstrate attached payload hardware will withstand a maximum preload of 6430 lbs from the PAS/UCCAS capture latch.	A&T	CofC	
						a2) Development and submittal of strength test shall show Attached Payload hardware will withstand a maximum preload of 6430 lbs from the PAS/UCCAS capture latch. a3) Development and submittal of a functional test shows the Attached Payload hardware when mounted on a simulated CAS active half, is capable of achieving a nominal preload of 5650 lbs $\pm$ 5% applied to the payload passive PAS by the CLA.			
						a4) Structural analysis to demonstrate margins of safety for loads applied to the CLA/capture bar (Capture bar at PAS coordinates X=0, Y=0, and Z=1.142) as the shown in Figure 3.1.2.3-1 of SSP 57004.			
						b) JSC review, inspection and acceptance of attached payload Interface preload analysis and testing summaries to assure a maximum preload of 6430 lbs from the PAS/UCCAS capture latch and is capable of achieving a nominal CLA preload of 5650 lbs $\pm$ 5% applied to the payload passive PAS.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
34	IRD SSP 57003	3.1.3.1.3.1 4.3.1.3.1.3.2	A	Interface Stiffness	The stiffness of the attached payload interface in the z direction shall be 13500+/- 10% lbf/in. Verification shall be by test.	a) Development, and submittal of test results that demonstrate attached payload interface stiffness meets the requirements of paragraphs 3.1.3.1.3.2. a1) gap analysis based on 135000 lbf/in preload based on worst case thermal extremes	T	CofC	
					Verification shall be considered successful when test shows AP interface stiffness meets the requirements of paragraphs 3.1.3.1.3.2.	b1) Structural analysis to demonstrate margins of safety based on preload of 135000 lbf/in c) JSC review, inspection and acceptance of attached payload test summaries that assure interface stiffness meets the requirements of paragraphs 3.1.3.1.3.2.			
35	IRD SSP 57003	3.1.3.2.1 4.3.1.3.2.1	A	EVA Releasable and Removable Capture Bar	A. Attached payload design shall include an EVA releasable and removable capture bar to interface with the PAS/UCCAS CLA per SSP 30256:001 Verification shall be by inspection of the production drawings. Verification shall be considered successful when the inspection shows that an EVA releasable and removable capture bar is provided by the Attached Payload design and that all crew EVA interfaces IRD SSP 57003 Revision A August 5, 2002 associated with the operation, removal and reinstallation of the EVA releasable and removable capture bar are in accordance with SSP 30256:001.	a1) Development, and submittal of inspection summary that demonstrates attached payload EVA releasable/ removable capture bar provides for all crew EVA interfaces in accordance with IRD SSP 57003 Revision A with the operation, removal and reinstallation of the EVA releasable and removable capture bar are in accordance with SSP 30256:001 and SSP 57004, Para. 3.1.2.2. a2) Form, fit and function test	I,A,&T	CofC	
					B. EVA releasable and removable capture bar design, location, and tolerances shall be in accordance with SSP 57004, Figure 3.1.2.2-1 Verification shall be by analysis. Verification shall be considered successful when the analysis shows that the design, location and tolerances are in accordance with SSP 57004.	b1) Development, and submittal of analysis that demonstrates attached payload analysis shows design, location and tolerances are in accordance with SSP 57004 SSP 57004, Figure 3.1.2.2-1 b2) Form, fit, and function to verify tolerances specified on SSP 57004, Figure 3.1.2.2-1			
					C. The design of the EVA releasable and removable capture bar shall allow removal of the preload and subsequent removal and reinstallation of the capture bar. Verification shall be by test. Verification shall be considered successful when the Attached Payload shows by test using the Active Common Attach System Simulator (ACASS) that the maximum release dimension shown in section 3.1.3.2.1 can be	c1) Submittal of test summaries that demonstrate AP using ACASS that maximum release dimension in section 3.1.3.2.1 are attained and the bar may be subsequently removed and reinstalled. in worst case thermal profiles c2) Analysis/test of preload requirements to demonstrate that			

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					attained and that the bar may be subsequently removed and reinstalled.	removal and reinstall encompass the PAS/UCCAS deflection c3) Analysis/test to demonstrate that stiffness, interface preload, and interface stiffness of 9400 lbf/in with 0.71 in stroke on a passive PAS. d) JSC review, inspection and acceptance of attached payload EVA removable capture bar analysis, tests and inspection summaries.			
36	IRD SSP 57003	3.1.3.2.2 4.3.1.3.2.2	A	Guide Pins	A. The attached payload shall have 3 guide pins for interface to the PAS/UCCAS guide vanes. Verification shall be by test to verify that three guide pins for interfacing with the PAS/UCCAS guide vanes are provided by the Attached Payload design. Verification shall be considered successful when the test shows that the requirement of interfacing with the PAS/UCCAS guide vanes has been satisfied.	a1) Development and submittal of test summaries that demonstrate attached payload design provides three guide pins for interfacing with the PAS/UCCAS guide vanes per Figure SSP 57004, Figure 3.1.2.2-1	A&T	CofC	
					B. The guide pins design, location, and tolerances shall be in accordance with SSP 57004, Figure 3.1.2.2-1 Verification shall be by analysis. Verification shall be considered successful when the analysis shows that the design, location and tolerances are in accordance with SSP 57004.	b1) Development, and submittal of analysis that demonstrate AP guide pin shows that the design, location and tolerances are in accordance with SSP 57004, Figure 3.1.2.2-1. c) JSC review, inspection and acceptance of attached payload analysis and test summaries to assure AP design provides three guide pins for interfacing with the PAS/UCCAS guide vanes and design, location and tolerances are in accordance with SSP 57004.			
37	IRD SSP 57003	3.1.3.2.3 4.3.1.3.2.3	A	Passive Umbilical Mechanism	A. The AP shall use the passive UMA part # 1F70162 to interface to the PAS/UCCAS UMA active half. Verification shall be by analysis. Verification shall be considered successful when the analysis shows that the Attached Payload UMA configuration has provided the structural/mechanical interface to the PAS/UCCAS UMA part number 1F70162-1, or equivalent, to allow physical integration of the Attached Payload to a truss site.	a1) Development, and submittal of analysis summaries that demonstrates attached payload UMA configuration has provided structural/mechanical interface to the PAS/UCCAS UMA part number 1F70162-1, or equivalent, to allow physical integration of the Attached Payload to a truss site per SSP 57004, Para. 3.1.2.2 a2) Form fit and function test to demonstrate that Part# 1F70162 properly interfaces with PAS/UCCAS UMA a3) Design review to assure that part # 1F70162 is called out in attached	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						<p>payload drawings</p> <p>a4) Verification that that Part# 1F701622 meets SSP 57004, para. 3.1.2 b1) Development, and submittal of analysis summaries that demonstrates attached payload UMA configuration is accessible for manual EVA backup operations and EVA removal in accordance with SSP 50005, paragraph 12.3.</p> <p>a5) Analysis and inspection to verify that part# 1F70162 matches interface and SSP 57004 drawing specification TBD.</p>			
					<p>B. The passive UMA shall be accessible for manual EVA backup operations and EVA removal in accordance with SSP 50005, para. 12.3. Verification shall be by analysis. Verification shall be considered successful when the analysis shows that the Attached Payload UMA configuration is accessible for manual EVA backup operations and EVA removal in accordance with SSP 50005, paragraph 12.3.</p>	<p>b1) Testing, analysis, and inspection to demonstrate passive UMA compliance with SSP 50005, para 12.3</p> <p>b2) Structural verification plan to define testing and analysis to show margins of safety based on minimum and maximum loading conditions and 100 lb force and to assure stiffness design demonstrates compliance with SSP 57004, Table 3.1.3.2.1-1</p> <p>b2) Crew training to verify EVA accessibility capabilities of the passive UMA</p>			
						<p>b3) Design review of drawing against hardware to verify SSP 50005 , para 12.3</p> <p>c) JSC review, inspection and acceptance of attached payload UMA, PAS/UCCAS analysis to assure structural/mechanical interface to the PAS/UCCAS UMA part number 1F70162-1, or equivalent, to allow physical integration of the Attached Payload to a truss site and UMA configuration is accessible for manual EVA backup operations and EVA removal in accordance with SSP 50005, paragraph 12.3.</p>			
38	IRD SSP 57003	3.1.3.2.3.1 4.3.1.3.2.3.1	A	Passive UMA Mounting Bracket	<p>A. The AP shall locate the passive UMA on the payload structure as defined in SSP 57004, Figure 3.1.2.21. Verification shall be by analysis and test. Verification shall be considered successful when the analysis shows that the passive UMA is located on the payload</p>	<p>a) Development and submittal of analysis that demonstrates attached payload passive UMA is located on the payload structure as defined in SSP 57004, Figure 3.1.2.2-1</p>	A&T - FEM, VLA, DLA	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					structure as defined in SSP 57004, Figure 3.1.2.2-1 and when the test shows that the AP structurally and mechanically interfaces with the passive UMA and allows physical integration of the PAS/UCCAS UMA passive and active halves.				
					B. The interface on the attachment of the passive UMA shall be designed to withstand a 100 lb interface load in any direction at 5.49 in. below(-Z) and centered between the (4) UMA structural attachment bolt centerlines. Verification shall be by analysis. Verification shall be considered successful when the analysis shows that AP passive UMA mounting bracket has been designed to the interface loads specified in 3.1.3.2.3.1.	a2) Development and submittal of testing summary that demonstrates attached payload structurally and mechanically interfaces with the passive UMA and allows physical integration of PAS/UCCAS UMA passive and active halves.			
						b) Development and submittal of analysis summary that demonstrates attached payload passive UMA mounting bracket is designed to interface loads specified in 3.1.3.2.3.1. IRD SSP 57003 Revision A			
					C. The UMA interface defined in SSP 57004, Figure 3.1.2.2-1 shall meet or exceed the stiffness specified in Table 3.1.3.2.3.1-1. Verification shall be by analysis. Verification shall be considered successful when the analysis shows that the AP UMA mounting bracket satisfies the stiffness requirement specified in Section 3.1.3.2.3.1.	c1) Development, and submittal of analysis summary demonstrates attached payload UMA mounting bracket satisfies stiffness requirement in Section 3.1.3.2.3.1. d1) Development, and submittal of analysis summary that demonstrate attached payload UMA passive half as mounted is maintained within on-orbit operating temperature range.			
					D. The AP shall be designed to maintain the UMA passive half within its on-orbit operating temperature of -90 to 190F. Verification shall be by analysis. Verification shall be considered successful when the analysis shows that UMA passive half as mounted is maintained within its on-orbit operating temperature range. A passive UMA model, including thermal properties at the interface, shall be supplied by NASA.	d2) NASA supplied passive UMA model, including thermal properties at the interface are provided to customer.			
						e) JSC review, inspection and acceptance of attached payload testing and analysis to assure passive UMA is located on the payload structure, allows physical integration of			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						PAS/UCCAS UMA passive and active halves, UMA mounting bracket is designed to interface loads specified in 3.1.3.2.3.1. IRD SSP 57003, AP UMA mounting bracket satisfies stiffness requirement in Section 3.1.3.2.3.1, and UMA passive half as mounted is maintained within on-orbit operating temperature range.			
39	IRD SSP 57003	3.1.3.2.4 4.3.1.3.2.4	A	Mechanical Stop Design	A. Mechanical stops shall be designed with the mechanical strength necessary to absorb the maximum expected energy when contact is made using FOS defined in SSP 52005, section 5.0 Verification shall be by analysis.	a1) Development and submittal of analysis summary that demonstrate attached payload on orbit flight drawings and design includes mechanical stops for all gimbaled and mechanical actuating devices designed with the mechanical strength necessary to absorb the maximum expected energy when contact is made using the factors of safety defined in SSP 52005. a2) Assessment and test to define worst case maximum expected energy	A T?		
					Verification shall be considered successful when it has been shown that the Attached Payload on orbit flight drawings and design includes mechanical stops for all gimbaled and mechanical actuating devices that have been designed with the mechanical strength necessary to absorb the maximum expected energy when contact is made using the factors of safety defined in SSP 52005.	a3) Design review of mechanical stop drawings against hardware a4) Testing of qualification hardware to demonstrate that mechanical stops absorb energy after 4 times # of duty cycles a5) Testing, analysis, and inspection of qualification hardware to demonstrate 4X life			
					B. Mechanical stops shall be designed for 4X times the number of duty cycles expected in operational use, including duty cycles encountered during testing. Verification shall be by analysis.	b) Development and submittal of analysis summary that demonstrate attached payload mechanical stops have been designed for four times the number of expected duty cycles			
					Verification shall be considered successful when it has been shown that the Attached Payload mechanical stops have been designed for four times the number of expected duty cycles.	b2) Development and submittal of test summary that demonstrate attached payload mechanical stops have been designed for four times the number of expected duty cycles c) JSC Mechanical System Working Group review, inspection and acceptance of mechanical stop design, drawings, and testing for all attached payload gimbaled/mechanical actuating devices designed and mechanical strength necessary to absorb the			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						maximum expected energy when contact is made using the factors of safety defined in SSP 52005			
40	IRD SSP 57003	3.1.3.2.5 4.3.1.3.2.5	A	Safety Interlocks	Safety interlocks shall be provided to protect against unsafe operations when access to attached payload equipment is required for on orbit maintenance Verification shall be by analysis. An analysis shall be performed using data from drawings, software requirements/implementation documentation, hazard analyses, and ICDs to identify hazardous operations during maintenance and the implementation of related safety interlocks.	a) Development and submittal of analysis summary that demonstrate attached payload data from drawings, software requirements/implementation documentation, hazard analyses, and ICDs identify hazardous operations during maintenance and the implementation of related safety interlocks provide the necessary inhibit functions for all identified hazards during maintenance.	A Safety?	CofC	
					The verification shall be considered successful when it has been shown that installed interlocks provide the necessary inhibit functions for all identified hazards during maintenance.	b) JSC review, inspection and acceptance of analysis summary that demonstrate attached payload hazardous operations during maintenance and the implementation of related safety interlocks provide necessary inhibit functions for all identified hazards during maintenance.			
41	IRD SSP 57003	3.1.3.2.6.1 4.3.1.3.2.6.1	A	Limit Quasi-static Accelerations	For frequencies below 0.01 Hz, attached payloads shall limit unbalanced transitional average impulse to generate less than 10lb-s (44N-s) within any 10 to 500 second period, along any ISS coordinate system vector.	a) Development and submittal of analysis summary that demonstrates attached payload forces produced by a payload below 0.01 Hz are verified when it is shown that no impulse is exerted by the payload to the ISS greater than 10 lbs-s (44.5 N-s) over any 10 to 500 second interval. as specified in paragraph 3.1.3.2.6.1.	A		
					Forces produced by a payload below 0.01 Hz shall be verified by analysis against paragraph 3.1.3.2.6.1. This analysis shall be considered successful when it is shown that no impulse is exerted by the payload to the ISS greater than 10 lbs-s (44.5 N-s) over any 10 to 500 second interval.	b) JSC review, inspection and acceptance of attached payload analysis summary that assures attached payload forces produced by a payload below 0.01 Hz are verified when it is shown that no impulse is exerted by the payload to the ISS greater than 10 lbs-s (44.5 N-s) over any 10 to 500 second interval. as specified in paragraph 3.1.3.2.6.1.			
42	IRD SSP 57003	3.1.3.2.6.2.1 4.3.1.3.2.6.2.1	A	Vibratory Requirements	Between 0.01 and 300 Hz, payloads shall limit vibration so that acceleration limits of Figure/Table 3.1.3.2.6.2.1-1 are not exceeded using simultaneously the force transfer	a1) Submittal of analysis and test summaries that demonstrate AP interface forces less than the limits specified in para. 3.1.3.2.6.2.1 (used to	A or T		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					functions of figures/tables 3.1.3.2.6.2-2/4 and moment transfer functions of figures/tables 3.1.3.2.6.2-3/5	limit force and moment transfers between frequencies of 0.01 to 300 Hz.)			
					Verification of non-isolated attached payload mechanical vibration against 3.1.5.2 shall be accomplished by FEM, Statistical Energy Analysis (SEA), test/simplified analysis as discussed in the following paragraphs. FEM analysis is to be performed to the ISS side of the PAS Interface Plane using a force limit (Table 3.1.5.2-1P.	a2) List of forces and moments about the attached payload capture latch ISS interface based on payload disturbances a3) Submittal of analysis/test summaries that demonstrate AP non-isolated mechanical vibration against are accomplished by FEM, SEA, test or simplified analysis in accordance with 3.1.5.2.			
					B. The root-sum-square acceleration response shall be calculated with the transfer functions or an approved surrogate for each resolved force and moment.	b1) Submittal of analysis/test summaries that demonstrate AP disturbance frequency variation/uncertainty which exceeds 10% use worst-case assumptions for frequency disturbances close to one-third octave boundaries.			
					For each AP disturbance, the interface forces shall be resolved into an equivalent set of forces and moments about the capture latch of the AP to ISS interface. APs with disturbance frequency variation and uncertainty which exceeds 10% shall use worst-case assumptions for frequency disturbances close to one-third octave boundaries.	Root sum square force/moment assessment that accounts for transfer functions and/or approved surrogate.			
					E. The resulting accelerations shall not exceed the acceleration limit of Figure 3.1.3.2.6.2-1. For the frequency range above 50 Hz, either SEA or FEM may be used. SEA models shall use a loss factor coefficient of 0.5% unless alternative values are justified by payload test. FEM models are to be used to the highest frequency verified by test.	e) Analysis and tests that demonstrate that attached payload vibrations accelerations are in compliance with Figure 3.1.3.2.6.2-1.. Development and submittal of analysis and test summaries that demonstrate attached payload frequency range above 50 Hz use a loss factor coefficient of 0.5% unless alternative values are justified by payload test for SEA models.			
					FEM models may also be used beyond the range verifiable by test to envelope possible attached payload response as an alternative to SEA. Test data analysis may be used to adjust the damping coefficient used in either FEM or SEA models or to adjust the coupling coefficients and loss factor used for SEA models. Verification is successful when the analysis or test results show that the interface	f) Development and submittal of analysis and test summaries that demonstrate attached payload interface forces are less than the limits specified in paragraph 3.1.3.2.6.2.1. d) JSC review, inspection and acceptance of attached payload FEM and SEA to assure compliance with paras. 3.1.5.2 and 3.1.3.2.6.2.1.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					forces are less than the limits specified in paragraph 3.1.3.2.6.2.1.				
43	IRD SSP 57003	3.1.3.2.6.2.2 4.3.1.3.2.6.2.2	A	Transient Requirements	A. APs shall limit force applied to the ISS over any 10 second period to an impulse of no greater than 10 lbs. Verification of maximum transient impulse shall be by analysis or test. Acceptable test methods are defined in SSP TBD, Appendix E.	a) Development, and submittal of analysis and test summaries that demonstrate attached payload impulse over any 10 second period is shown to be less than 10 lb s (44.5 N s) and when the sum of the impulse and vibration resulting from the impulse do not exceed the vibratory limits of 3.1.5.2 over any 100 second period.	AorT		Remove TBD for acceptable Test methods?
					Verification shall be considered successful when the impulse delivered by an AP over any 10 second period is shown to be less than 10 lb s (44.5 N s) and when the sum of the impulse and vibration resulting from the impulse do not exceed the vibratory limits of 3.1.5.2 over any 100 second period. FEM time domain analysis is an acceptable verification method for this requirement as defined in 4.3.1.5.2. Acceleration or force response test data is acceptable if interface impedance considerations are included, including adjustment for possible modal frequency shift and interface structural amplification or attenuation.	b1) Development and submittal of analysis and/or test demonstrates attached payload maximum force at the attached payload interface shall be less than 1000 lb (4448 N) in any direction will not exceed 1000 lb (4448 N).			
					B. APs shall limit their peak force applied to the ISS to less than 1000 lb. (4448 N) for any duration. The maximum force at the attached payload interface, as determined by either analysis or test, shall be less than 1000 lb (4448 N) in any direction.	c) JSC review, inspection and acceptance of attached payload to assure attached payload impulse over any 10 second period is shown to be less than 10 lb s (44.5 N s) and			
					Rigid body analysis may be used if it can be shown that the rigid payload force to a rigid interface will not exceed 500 lb (2224 N). Otherwise, FEM payload analysis using a Payload Project Office supplied ISS model must be used to show that the flexible interface force will not exceed 1000 lb (4448 N).	when the sum of the impulse and vibration resulting from the impulse do not exceed the vibratory limits of 3.1.5.2 over any 100 second period and attached payload maximum force at the attached payload interface shall be less than 1000 lb (4448 N) in any direction will not exceed 1000 lb (4448 N).			
44	IRD SSP 57003	3.1.3.2.6.3.1 4.3.1.3.2.6.3.1	A	Limit Induced ISS Attitude Rate	Payload shall have an angular momentum impulse of less than the per axis values shown on Table 3.1.3.2.6.3.1-1 during any continuous 9 minute period. Over no interval time of 10 seconds or less shall a payload angular momentum impulse to	a1) Development and submittal of analysis summary that demonstrates attached payload on-board worst-case combined source conditions against the two minute and ten second limits per axis angular momentum impulses	A		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					exceed 250 ft-lbs-(340 N-m-s) This requirement shall be verified by analysis.	specified for each axis and angular momentum allocations to verify allocations are not exceeded independently against the nine minute limit.			
					Each attached payload shall be verified under worst-case combined source conditions against the two minute and ten second limits. The verification shall be considered successful when analysis shows that the per axis disturbance angular momentum impulses are	a2) Analysis and test to demonstrate that angular momentum is less 930. 1277, and 2876 ft-lb-sec in the Hx, Hy, and Hz axis respectively over a 9 minute period. a3) Analysis and tests to verify that payload angular momentum is less than 250 ft-lbs-sec during any 10 second or less time frame.			
						b) JSC review, inspection and acceptance of attached payload summary that demonstrates attached payload on-board worst-case combined source conditions against the two minute and ten second limits per axis angular momentum impulses specified for each axis and angular momentum allocations to verify allocations are not exceeded independently against the nine minute limit.			
45	IRD SSP 57003	3.1.3.2.6.3.2 4.3.1.3.2.6.3.2	A	Limit Disturbance Induced CMG Moment Usage	When the on-orbit Space Station is in the microgravity mode, any disturbance induced on the on-orbit Space Station by an individual disturbance source of a payload shall have an angular momentum impulse that produces an estimated Control Moment Gyroscope (CMG) momentum magnitude less than 10,000 ft-lb-sec (13,558 N-m-sec) during any continuous 110 minute period when evaluated per the expression in Table 3.1.3.2.6.3.2-1.	a1) Development and submittal of analysis summary (using analytical models of the disturbance) that demonstrate payload and ISS assembly worst case estimated worst case CMG momentum usage is less than the specified amount.(with respect to the requirement of Table 3.1.3.2.6.3.2-1)	A		Can the crew apply the dry film lube during EVA operations?
					This requirement shall be verified by analysis utilizing analytical models of the disturbance. This analysis shall consist of calculating the angular momentum impulse for each axis due to individual payload on-board disturbances and applying them in the specified equation for estimating worst case CMG momentum usage.	a2) Analysis and evaluation of payload angular momentum impulse disturbances per expression in Table 3.1.3.2.6.3-1 to verify that estimated CMG magnitudes is less than 10000 ft-lb-s.			
					The verification shall be considered successful when analysis shows that the estimated worst				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					case CMG momentum usage is less than the specified amount.				
					This analysis shall consist of calculating the angular momentum impulse for each axis due to individual payload on-board disturbances and applying them in the specified equation for estimating worst case CMG momentum usage.	b) JSC review, inspection and acceptance of attached payload and ISS assembly (with respect to the requirement of Table 3.1.3.2.6.3.2-1) estimated worst case CMG momentum usage is less than the specified amount.			
					ISS assembly complete mass properties and worst case element location/design parameters (location and orientation producing the greatest H impulse vector with respect to the requirement of Table 3.1.3.2.6.3.2-1) should be used when assessing compliance with this requirement.				
					The verification shall be considered successful when analysis shows that the estimated worst case CMG momentum usage is less than the specified amount.				
46	IRD SSP 57003	3.1.3.2.7 4.3.1.3.2.7	A	Contact Surfaces	The AP capture bar, guide pins, and associate passive half platform structure subject to contact shall be coated with a dry film lubricant and provide a .25" minimum edge radius as depicted in SSP 57004, Figure 3.1.2.2-1.	a1) Development and submittal of inspection summary to demonstrate attached payload production drawings verify Capture Bar, Guide Pins and passive half platform contact areas are coated with a dry film lubricant and provide a .25" minimum edge radius in accordance with SSP 57004.	I	CofC	
					Verification shall be by inspection of the production drawings to verify that the Attached Payload Capture Bar, Guide Pins and passive half platform subject to contact are coated with a dry film lubricant and provide a .25" minimum edge radius in accordance with SSP 57004.	a2) Design review to verify that drawings call outs include dry film lubricant a3) OMRS to assure that dry film lube is installed			
						a4) Design review, and inspection to assure that SSP 57004, Figure 3.1.2.2-1 and flight hardware provide a 0.25" edge radius a5) OMRS to include swatch testing of all contact surfaces edges a6) JSC Materials approval for use of dry film lubricant (EMU compatibility assessment)			
						a7) Toxicity assessment of dry film lubricant to demonstrate that materials			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						are not toxic to crew. b) JSC review, inspection and acceptance of attached payload Capture Bar, Guide Pins and passive half platform contact surfaces are coated with a dry film lubricant and provide a .25" minimum edge radius in accordance with SSP 57004.			
47	IRD SSP 57003	3.1.4.1 4.3.1.4.1	A	Interface with NSTS RMS and SSRMS	AP interfaces with the SRMS and SSRMS for on-orbit activities shall be designed in accordance with Para. 3.7.1 and 3.7.3. Translation of the robotic arm with the Attached Payload on ISS shall be verified by analysis.	a1) Design review against drawings to verify attached payload to SSRPMS interface in accordance with SSP 42004 , table 1.4.1.2-1 b1) Design review against hardware and drawing to verify compliance table 3.7.3-1 for mobile servicing properties. d1) Analysis and testing to verify capture/berthing/and closure forces/moments that overcome static friction per table 3.7.3-3	A	CofC	
					The robotics analysis using MAJIK (or an equivalent tool) shall be based on review of the ISS traffic model, system design and flight element drawings and the data from functional interface test and dynamic simulations conducted during end item certification activities.	e1) Analysis and testing to demonstrate ready to latch indication to positively indicate that the 2 pieces of equipment are placed within the berthing mechanism's envelope f1 and j1) Design review against hardware and drawing to verify compliance scuff plates (NSTS 21000 Figure 3.3.1.1.2.2.2-1), and capture envelope (NSTS 21000, Table 3.7.1-1)			
					The analysis shall be considered successful when data shows that the robotic arm with the Attached Payload can translate along a ISS translation corridor without violating the EVR clearance requirements of SSP 30550 and SSP 42004.	g1) Design review of hardware and drawing to verify shielding of critical and hazardous attached payload components i1) Analysis and testing to demonstrate that programmable backdrive (after the initial contact are within the SSRMS) programmable force/moment accommodation capability of Table 3.7.3-4, when the SSRMS elbow joint angle is not less than 60 degrees from the straight arm configuration and the moment distance between the GF and berthing contact point is 14.76 ft(4.5m) k1) Design review against hardware to verify location of the attached payload GF in the unique ICD.			
						a2,b2,f2) Development, and submittal			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						of AP inspection summary of flight drawings to show compliance with the requirement as specified. d2,g2,i2,j2). Development, and submittal of AP analysis summary that shows compliance with the requirement as specified.			
						e2. Development and submittal of AP summary analysis or demonstration that shows compliance with the requirements as specified. k2. Development and submittal of AP inspection summary of flight drawings in the unique Attached Payload hardware ICD that shows compliance with the requirements as specified.			
						a3) Development and submittal of Inspection summary that demonstrates grapple fixtures are in accordance with SSP 30550, SSP 42004 and the unique ICD as documented in Attached Payload flight drawings.			
						a4) Development and submittal of analysis summary that demonstrates attached payload robotics analysis model using MAJAK is based on the ISS traffic model, system design/flight element drawings, and data from functional interface test/dynamic simulations conducted during end item certification activities to verify that robotic arm can translate along a ISS translation corridor without violating the EVR clearance requirements of SSP 30550 and SSP 42004.			
						a5) Development and submission of test summary addressing functional interface test/dynamic simulations conducted during end item certification activities when data shows that the robotic arm can translate along a ISS translation corridor without violating the EVR clearance requirements of SSP 30550 and SSP 42004.			
						a6) Development and submittal of analysis summary that demonstrates			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						attached payload robotics analysis can translate along a ISS translation corridor without violating the EVR clearance requirements of SSP 30550 and SSP 42004. b3) JSC review, inspection and acceptance of attached payload grapple fixtures are in accordance SSP 42002, and NSTS 21000, and IRD SSP 57003 Table 3.7.3-4, and the unique ICD to assure ISS translation corridor without violating the EVR clearance requirements			
48	IRD SSP 57003	3.1.4.1.1 4.3.1.4.1.1	A	GF Locations	The AP shall locate grapple fixtures in accordance with para. 3.7.1 and 3.7.3 and locate them so as to not exceed the structural and mechanical capability of the PAS/UCCAS sites.	a1) Design review against drawings to verify attached payload to SSRPMS interface in accordance with SSP 42004 , table 1.4.1.2-1	I	CofC	
						b1) Design review against hardware and drawing to verify compliance table 3.7.3-1 for mobile servicing properties.			
						d1) Analysis and testing to verify capture/berthing/and closure forces/moments that overcome static friction per table 3.7.3-3 e1) Analysis and testing to demonstrate ready to latch indication to positively indicate that the 2 pieces of equipment are placed within the berthing mechanism's envelope			
						f1 and j1) Design review against hardware and drawing to verify compliance scuff plates (NSTS 21000 Figure 3.3.1.1.2.2.2-1), and capture envelope (NSTS 21000, Table 3.7.1-1)			
					The accommodation of grapple fixtures on the AP shall be verified by inspection.	g1) Design review of hardware and drawing to verify shielding of critical and hazardous attached payload components			
						i1) Analysis and testing to demonstrate that programmable backdrive (after the initial contact are within the SSRMS) programmable force/moment accommodation capability of Table 3.7.3-4, when the SSRMS elbow joint angle is not less			

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						that 60 degrees from the straight arm configuration and the moment distance between the GF and berthing contact point is 14.76 ft(4.5m)			
						k1) Design review against hardware to verify location of the attached payload GF in the unique ICD.			
						a2,b2,f2) Development, and submittal of AP inspection summary of flight drawings to show compliance with the requirement as specified. d2,g2,i2,j2). Development, and submittal of AP analysis summary that shows compliance with the requirement as specified.			
					The inspection shall be based upon documentation defining the required grapple fixtures), the AP flight drawings, and the unique ICD. An inspection of AP flight drawings shall be performed to ensure that all grapple fixture interfaces are in accordance with SSP 30550, SSP 42004, and the location constraints of the unique ICD.	e2. Development and submittal of AP summary analysis or demonstration that shows compliance with the requirements as specified.			
						k2. Development and submittal of AP inspection summary of flight drawings in the unique Attached Payload hardware ICD that shows compliance with the requirements as specified.			
					The inspection shall be considered successful when the AP flight drawings document that all grapple fixtures are in accordance with SSP 30550, SSP 42004, and the unique ICD.	a3) Development and submittal of Inspection summary that demonstrates grapple fixtures are in accordance with SSP 30550, SSP 42004 and the unique ICD as documented in Attached Payload flight drawings. b) JSC review, inspection and acceptance of attached payload grapple fixtures are in accordance SSP 42002, and NSTS 21000, and IRD SSP 57003 Table 3.7.3-4, and the unique ICD.			
49	IRD SSP 57003	3.1.4.1.2 4.3.1.4.1.2	A	GF Structural Support	The AP shall provide the secondary structural support for grapple fixtures to facilitate SRMS and SSRMS robotic operations in accordance with para. 3.7.4 An analysis shall be performed of the Attached Payload structure production drawings to verify	a1) Development and submittal of analysis summary that demonstrates attached payload structure production drawings verify grapple fixture accommodations in accordance with section 3.7 and with SSP 30559.	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					that the grapple fixture accommodations are in accordance with section 3.7 and with SSP 30559 are provided. When it is shown that the requirements as specified in section 3.7 and SSP 30559 have been met, then the verification shall be satisfied.	a2) Development, and submittal of inspection and analysis summary that demonstrates AP compliance with the requirement as specified.			
						a3) Development, and submittal of analysis and inspection summary that demonstrates AP flight element drawings are performed to verify dexterous external equipment is as specified. a4) Development, and submittal of analysis and inspection summary that demonstrates AP compliance with mass properties, volume constraint, and a frequency requirements (structural analysis).			
						a5. Development, and submittal of analysis summary that demonstrates AP equipment requiring dexterous robot support address verification data is in compliance with SSP 30550, Volume 1, paragraphs 4.3.2.1.5, 4.3.2.2.4, 4.3.4.1.1 (excluding 4.3.4.1.1.5 and 4.3.4.1.1.6), 4.3.4.2.1.4, 4.3.4.2.1.5, 4.3.4.2.2 (excluding 4.3.4.2.2.1.3, 4.3.4.2.2.1.8, 4.3.4.2.2.1.10, 4.3.4.2.2.4, and 4.3.4.2.2.5), 4.3.4.3, 4.3.4.4.1.5, 4.3.4.4.1.6, 4.3.4.6, 4.3.4.7.2.1, 4.3.4.8.1.1.3, 4.3.4.9.2.1, 4.3.4.9.2.5, 4.3.4.9.2.6, 4.3.4.13, 4.3.4.15, 4.3.5.3.1, and 4.3.5.3.2.			
						a6) Development, and submittal of analysis that demonstrates AP worksites associated with equipment that requires dexterous robotics support in accordance with SSP 30550, Volume 1, paragraphs 4.3.3.1.1, 4.3.3.1.4, 4.3.3.1.5, 4.3.3.3.3, 4.3.3.3.5, 4.3.4.10.1.2, and 4.3.4.10.1.4.			
						a7) Development and submittal of inspection summary that demonstrates AP flight element drawings for equipment requiring temporary storage on the dexterous robot is compliant			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						with the requirement as specified.			
						a8) JSC review, inspection and acceptance of AP analysis and inspection summaries to assure compliance with requirements specified and SSP 30550. b) JSC review, inspection and acceptance of attached payload analysis summary to assure structure production drawings verify grapple fixture accommodations in accordance with section 3.7 and with SSP 30559			
50	IRD SSP 57003	3.1.4.2 4.3.1.4.2	A-57003 NA- 57213	Interface with SPDM	APs interfaces with the SPDM for on-orbit activities (loading/unloading of payload items) shall be in accordance with Para. 3.7.4 Translation of the SPDM robotic arm with Attached Payload equipment or ORUs shall be verified by analysis. The analysis shall be based on review of the ISS traffic model, system design and flight element drawings and the data from functional interface test and dynamic simulations conducted during end item certification activities. The analysis shall be considered successful when data shows that the SPDM robotic arm with the Attached Payload equipment or ORUs can translate without violating EVR clearance requirements.	a1) Development, and submittal of analysis that demonstrate attached payload can translate without violating EVR clearance requirements based on review of the ISS traffic model, system design/flight element drawings. a2.1) Development, and submittal of functional interface test and dynamic simulations summaries conducted during end item certification activities to demonstrate attached payload can translate without violating EVR clearance requirements.	A	CofC	
						a2.2) Development and submittal of analysis summary that demonstrates attached payload structure production drawings verify grapple fixture accommodations in accordance with section 3.7 and with SSP 30559. a2.3) Development, and submittal of inspection and analysis summary that demonstrates AP compliance with the requirement as specified.			
						a3) Development, and submittal of analysis and inspection summary that demonstrates AP flight element drawings are performed to verify dexterous external equipment is as specified. a4) Development, and submittal of analysis and inspection summary that demonstrates AP compliance with mass			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						properties, volume constraint, and a frequency requirements (structural analysis).			
						a5) Development, and submittal of analysis summary that demonstrates AP equipment requiring dexterous robot support address verification data is in compliance with SSP 30550, Volume 1, paragraphs 4.3.2.1.5, 4.3.2.2.4, 4.3.4.1.1 (excluding 4.3.4.1.1.5 and 4.3.4.1.1.6), 4.3.4.2.1.4, 4.3.4.2.1.5, 4.3.4.2.2 (excluding 4.3.4.2.2.1.3, 4.3.4.2.2.1.8, 4.3.4.2.2.1.10, 4.3.4.2.2.4, and 4.3.4.2.2.5), 4.3.4.3, 4.3.4.4.1.5, 4.3.4.4.1.6, 4.3.4.6, 4.3.4.7.2.1, 4.3.4.8.1.1.3, 4.3.4.9.2.1, 4.3.4.9.2.5, 4.3.4.9.2.6, 4.3.4.13, 4.3.4.15, 4.3.5.3.1, and 4.3.5.3.2.			
						a6) Submittal of analysis that demonstrates AP worksites associated with equipment that requires dexterous robotics support in accordance with SSP 30550, Volume 1, paragraphs 4.3.3.1.1/4/5, 4.3.3.3.3/5, 4.3.4.10.1.2, and 4.3.4.10.1.4. a7) Submittal of inspection summary that demonstrates AP flight element drawings for equipment requiring temporary storage on the dexterous robot is compliant with the requirement.			
						a8) JSC review, inspection and acceptance of AP analysis/inspection summaries to assure compliance with SSP 30550. b) JSC review, inspection and acceptance of attached payload analysis summary to assure structure production drawings verify grapple fixture accommodations in accordance with section 3.7 and SSP 30559			
						c) JSC review, inspection and acceptance of attached payload analysis and test summaries that demonstrate attached payload translation without violating EVR clearance requirements.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
51	IRD SSP 57003	3.1.4.2.1 4.3.1.4.2.1	A-57003 NA- 57213	SPDM Fixture Locations	A. The AP shall include all stabilization aids (i.e. H-fixture) necessary for all dexterous robotics operations to be conducted on the attached payload in accordance with SSP 30550, para. 3.4.10. The accommodation of SPDM fixtures (i.e., microconicals) on the Attached Payload shall be verified by inspection. The inspection shall be based upon documentation defining the required SPDM fixtures), the Attached Payload flight drawings, and SSP 57004.	a) Development, and submittal of inspection summary that demonstrate attached payload SPDM fixtures are accommodated based on defining required SPDM fixtures), Attached Payload flight drawings, and SSP 57004.( include stabilization aides per 30550, para. 3.4.10)	I	CofC	
					B. SPDM fixtures shall be placed such that operational induced loads do not exceed the structural and mechanical capability of the PAS/UCCAS. An inspection of AP flight drawings shall be performed to ensure that all SPDM fixture interfaces are in accordance with SSP 42004 and the location constraints of SSP 57004. The inspection shall be considered successful when the AP flight drawings document that all SPDM fixtures are in accordance with SSP 42004 and SSP 57004.	b) Development, and submittal of inspection summary that demonstrate attached payload of Attached Payload flight drawings are completed to ensure that all SPDM fixture interfaces are in accordance with SSP 42004 and the location constraints of SSP 57004. c) JSC review, inspection and acceptance of attached payload inspection summary to assure SPDM fixtures are accommodated based on defining required SPDM fixtures), Attached Payload flight drawings, SSP 42004, and SSP 57004.			
52	IRD SSP 57003	3.1.4.2.2 4.3.1.4.2.2	A-57003 NA- 57213	SPDM Fixture Structural Support	Every SPDM designated worksite shall provide the secondary structural support for a H-fixture interface to facilitate robotic operations in accordance with para. 3.7.4.	a) Development, and submittal of analysis summary that demonstrates attached payload structure SPDM fixture accommodations and production drawings are in accordance with SSP 30559 (section 3.7).	A	CofC	
					An analysis shall be performed of the AP structure production drawings to verify that the SPDM fixture accommodations are provided in accordance with section 3.7 and SSP 30559. When it is shown that the requirements as specified in section 3.7 and in SSP 30559 have been met, then the verification shall be satisfied.	b) JSC review, inspection and acceptance of attached payload analysis summary that demonstrates SPDM fixture accommodations and production drawings are in accordance with SSP 30559 (section 3.7).			
53	IRD SSP 57003	3.2.2.1 4.3.2.2.1.1	A	Steady-State Voltage Characteristics	The AP connected to Interface C shall operate and be compatible with the steady state voltage limits of 112.5 to 126 VDC A) Verification of compatibility with steady-state voltage limits shall be performed by test at low and high input voltage values of 112.5 to 126 VDC.	a) Development, and submittal of test summaries that demonstrate AP compatibility with steady-state voltage limits at low and high input voltage values of 112.5 to 126 VDC operated under selected loading conditions that envelope operational loading.	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					The AP shall be operated under selected loading conditions that envelope operational loading. The verification shall be considered successful when the test shows under low and high voltage conditions the AP is compatible with the steady-state voltage limits of 112.5 to 126 VDC.	b) JSC review, inspection and acceptance of AP test summaries that demonstrate AP compatibility with steady-state voltage limits at low and high input voltage values of 112.5 to 126 VDC operated under selected loading conditions that envelope operational loading.			
54	IRD SSP 57003	3.2.2.1.2.1 4.3.2.2.1.2.1	A	Ripple Voltage and Noise	The AP connected to the Interface C shall operate and be compatible with the EPS time domain ripple voltage and noise level of 2.5 volts root-mean-square maximum from 30 Hz to 10 kHz.	a1) Development, and submittal of analysis summaries that demonstrate attached payload ripple voltage/noise requirements are per SSP 30238 that operate and is compatible with EPS time domain ripple voltage/noise level of at least 2.5 Vrms within the frequency range of 30 Hz to 10 kHz.	A	Plot of Input Voltage vs. f	
					Ripple voltage and noise requirements shall be verified by analysis. The verification shall be considered successful when the CS-01 test per SSP 30238 shows the AP operates and is compatible with the EPS time domain ripple voltage and noise level of at least 2.5 Vrms within the frequency range of 30 Hz to 10 kHz.	a2) Development, and submittal of CS-01 test summaries that demonstrate attached payload ripple voltage/noise requirements are per SSP 30238 that operate and is compatible with EPS time domain ripple voltage/noise level of at least 2.5 Vrms within the frequency range of 30 Hz to 10 kHz.			
						b) JSC review, inspection and acceptance of attached payload CS-01 testing and ripple voltage/noise requirements are per SSP 30238 that operate and is compatible with EPS time domain ripple voltage/noise level of at least 2.5 Vrms within the frequency range of 30 Hz to 10 kHz.			
55	IRD SSP 57003	3.2.2.1.2.2 4.3.2.2.1.2.2	A	Ripple Voltage Spectrum	The AP connected to Interface C shall be compatible with the EPS spectrum shown in Figure 3.2.2.1.2.2-1. Ripple voltage spectrum requirements shall be verified by Analysis. Verification shall be considered successful when analysis of the CS-01 and CS-02 test data per SSP 30238, generated as a result of paragraph 4.3.2.2.4 of this document, shows the Attached Payload at interface C is compatible with the ripple voltage spectrum in Figure 3.2.2.1.2.2-1 of this document..	a1) Development, and submittal of analysis summary that demonstrate attached payload ripple voltage spectrum requirements demonstrate interface C compatibility with the ripple voltage spectrum in Figure 3.2.2.1.2.2-1.	A - Plot of Input V vs. f		
						a2) Development, and submittal of CS-01 and CS-02 test data per SSP 30238			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						test summaries that demonstrate attached payload ripple voltage spectrum requirements shows interface C is compatible with the ripple voltage spectrum in Figure 3.2.2.1.2.2-1. b) JSC review, inspection and acceptance of attached payload test and analysis to assure CS-01/CS-02 test data demonstrates ripple voltage spectrum requirements are compatible with the ripple voltage spectrum in SSP 30238 Figure 3.2.2.1.2.2-1.			
56	IRD SSP 57003	3.2.2.1.3.1 4.3.2.2.1.3.1	A	Normal Transient Voltages	The AP connected to Interface C shall operate and be compatible with the limits and magnitude and duration of the voltage transients as shown in Figure 3.2.2.1.3.1-1. (exclusive of ripple and noise components present). Transient voltages shall be verified by test or analysis.	a1) Development and submittal of analysis/test summaries that demonstrate attached payload input voltage is 112.5 Vdc and 126 Vdc with the Interface C source impedance (as specified in SSP 30482, Volume I). a2) Development and submittal of analysis/test summaries that demonstrate attached payload compatibility with specified transient voltages across the transient envelope as specified in Figure 3.2.2.1.3.1-1 of this document in accordance with IRD SSP 57003 Revision A, and EPS transient voltage characteristics as specified in Figure 3.2.2.1.3.1-1.	A or T	CofC	
					Input voltage shall be 112.5 VDC and 126 VDC with the Interface C source impedance, as specified in SSP 30482, Volume I. Verification of compatibility with the specified transient voltages shall be performed by test or analysis of the Attached Payload operation across the transient envelope as specified in Figure 3.2.2.1.3.1-1 of this document. The verification shall be considered successful when the test or analysis shows AP is compatible with the EPS transient voltage characteristics as specified in Figure 3.2.2.1.3.1-1.	b) JSC review, inspection and acceptance of attached payload analysis/test summaries that demonstrate attached payload input voltage is 112.5 Vdc and 126 Vdc with the Interface C source impedance (as specified in SSP 30482, Volume I) and compatibility with specified transient voltages across the transient envelope as specified in Figure 3.2.2.1.3.1-1 of this document in accordance with IRD SSP 57003 Revision A, and EPS transient voltage characteristics as specified in Figure 3.2.2.1.3.1-1.			
57	IRD SSP 57003	3.2.2.1.3.2 4.3.2.2.1.3.2	A	Fault Clearing and Protection	The AP connected to Interface C shall be safe and not suffer damage with the transient voltage conditions that are within the limits shown in Figure 3.2.2.1.3.2-1 Fault clearing and protection shall be verified by analysis.	a) Development, and submittal of analysis that demonstrate attached payload (at Interface C) does not produce an unsafe condition or one that could result in damage due to EPS transient voltages as specified in Figure	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						3.2.2.1.3.2-1.			
					The verification shall be considered successful when analysis shows the AP at Interface C does not produce an unsafe condition or one that could result in damage to ISS equipment or AP hardware from the EPS transient voltages as specified in Figure 3.2.2.1.3.2-1 of this document.	b) JSC review, inspection and acceptance of attached payload analysis summary to assure attached payload (at Interface C) does not produce an unsafe condition/ damage due to EPS transient voltages as specified in Figure 3.2.2.1.3.2-1.			
58	IRD SSP 57003	3.2.2.1.1.3 4.3.2.2.1.1.3	A	Interface C Non-normal voltage range.	A. The AP connected to Interface C shall not produce an unsafe condition or one that could result in damage to ISS equipment with maximum voltage to 165 VDC for up to 10 seconds and voltage below 102VDC for indefinite period of time. Verification of compatibility with maximum overvoltage conditions shall be performed by analysis.	a) Development and submittal of analysis summary that demonstrates attached payload compatibility with maximum overvoltage conditions that do not produce unsafe conditions/damage to ISS equipment as specified in paragraph 3.2.2.1.3.3 with all converters directly downstream of Interface C.	A	CofC	
					The analysis shall ensure the AP will not produce an unsafe condition or one that could result in damage to ISS equipment external to the AP when parameters are as specified in paragraph 3.2.2.1.3.3. The analysis should be performed with all converters directly downstream of Interface C. The verification shall be considered successful when analysis shows that AP is safe within ISS interface conditions as defined in paragraph 3.2.2.1.3.3.	b) Development and submittal of analysis summary that demonstrates attached payload compatibility with undervoltage conditions to show that there is no unsafe condition/damage to ISS equipment when parameters (as specified in paragraph 3.2.2.1.3.3) with all converters directly downstream of Interface C.			
					B. Verification of compatibility with undervoltage conditions shall be performed by analysis. The analysis shall ensure the AP will not produce an unsafe condition or one that could result in damage to ISS equipment external to the Attached Payload when parameters are as specified in paragraph 3.2.2.1.3.3. The analysis should be performed with all converters directly downstream of Interface C. The verification shall be considered successful when analysis shows the Attached Payload is safe within ISS interface conditions as defined in paragraph 3.2.2.1.3.3.	c) JSC review, inspection and acceptance of attached payload analysis summary that demonstrates compatibility with maximum overvoltage and undervoltage conditions to assure that no unsafe conditions/damage to ISS equipment as specified in paragraph 3.2.2.1.3.3 with all converters directly downstream of Interface C.			
59	IRD SSP 57003	3.2.2.2.1 4.3.2.2.2.1	A	Attached payload Connectors and pin assignments	A. APs shall utilize the passive UMA connector P/N NUR1-005 and shall meet the requirements of this connector as defined in SSQ 21637. AP to ISS Connectors shall be	a) Development and submittal of inspection summary and test demonstration results that demonstrate attached payload to ISS connectors are	I&D	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					verified by inspection and demonstration. The verification shall be considered successful when an inspection of the Attached Payload specifications and drawings shows the AP connector plug is the Passive UMA connector NUR1-005 or NASA approved equivalent meets the requirements for this connector as defined in SSQ 21637.	in accordance with specifications and drawings that detail connector plug is the Passive UMA connector NUR1-005 or NASA approved equivalent meets the requirements for this connector as defined in SSQ 21637.			
						b) Submittal of inspection summary and test demonstration to show pin assignments are in accordance with specifications and drawings show connector plug is the Passive UMA connector NUR1-005 or NASA approved equivalent meet the pin assignments and avionics interface terminations as specified in the unique payload hardware ICD per SSP 57004 and IRD SSP 57003 with the active UMA connector on the common attach system interface verification test article.			
					B. APs shall meet pin assignments and avionics interface terminations as specified in the unique payload ICD per SSP 57004. para. 3.2.1 in order to mate with the UMA connector. Pin Assignments shall be verified by inspection and demonstration.	c) JSC review, inspection and acceptance of attached payload of inspection summary and test demonstration to show pin assignments are in accordance with specifications and drawings show connector plug is the Passive UMA connector NUR1-005 or NASA approved equivalent meet the pin assignments			
					The verification shall be considered successful when an inspection of the AP Payload specifications and drawings shows the connector plug is the Passive UMA connector NUR1-005 or NASA approved equivalent meet the pin assignments and avionics interface terminations as specified in the unique payload hardware ICD per SSP 57004 and demonstrates successful mating with the active UMA connector on the common attach system interface verification test article.	and avionics interface terminations as specified in the unique payload hardware ICD per SSP 57004, SSQ 21637, and IRD SSP 57003 with the active and passive UMA connector on the common attach system interface verification test article.			
60	IRD SSP 57003	3.2.2.2.2 4.3.2.2.2.2	A	Power Bus Isolation	A. APs requiring power from 2 independent ISS power feeds shall provide a minimum of 1Mohm isolation in parallel with not more than 0.03 microfarads of mutual conductance	a) Development, and submittal of analysis that demonstrate attached payload power bus isolation between two independent ISS Power feeds	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					between the 2 independent power lines (including supply and return) such that no single failure shall cause the independent power feed to be electrically tied. Verification of Power Bus Isolation between two independent ISS Power feeds as specified, shall be performed by analysis.	shows a source voltage of + 126 Vdc, internal and external EPCE minimum of 1-megohm isolation (in parallel with not more than 0.03 microfarads of mutual capacitance) between the two independent power feeds (including both supply and return lines), and that no single failure causes independent power feeds to be electrically tied.			
					The verification shall be considered successful when the analysis shows the Attached Payload, with a source voltage of + 126 Vdc, and its internal and external Attached Payload EPCE provides a minimum of 1-megohm isolation in parallel with not more than 0.03 microfarads of mutual capacitance between the two independent power feeds including both the supply and return lines and that no single failure shall cause the independent power feeds to be electrically tied.	a2) Development, and submittal of analysis that demonstrate attached payload power bus isolation (without the use of diodes) shows two independent ISS power bus high side or return lines internal and external EPCE. b1) JSC review, inspection and acceptance of attached payload analyses that demonstrate attached payload power bus isolation between two independent ISS Power feeds shows a source voltage of + 126 Vdc with external EPCE minimum 1-megohm isolation (in parallel with not more than 0.03 microfarads of mutual capacitance) between the two independent power feeds (including both supply and return lines), and that no single failure causes independent power feeds to be electrically tied.			
					B. The AP shall use diodes to electrically tie together independent ISS power bus high side or return lines Verification of power bus isolation without the use of diodes shall be verified by analysis.	b2) JSC review, inspection and acceptance of attached payload analyses that demonstrate payload power bus isolation (without the use of diodes) shows two independent ISS power bus high side or return lines internal and external EPCE.			
					The analysis shall show the exclusion of diodes used to isolate the two independent ISS power bus high side or return lines. The verification shall be considered successful when analysis shows there are no diodes used to electrically tie together independent ISS power bus high side or return lines within the Attached Payload and its internal and external EPCE.				
61	IRD SSP 57003	3.3.2.2.2.3 4.3.2.2.2.3	A	Compatibility with soft Start/Stop Remote Power	The AP connected to Interface C shall initialize with a soft start/stop performance characteristics when power is applied,	a) Development, and submittal of test summaries that demonstrate attached payload compatibility with soft	T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
				Controller	sustained, and removed by control of remote power control switches. Compatibility with soft start/stop RPC(s) shall be verified by test.	start/stop performance characteristics when the initial supply power is provided to the equipment connected to the RPC(s), input power to delivered through a PRCU or equivalent, and multiple load combinations at levels ranging from 0% to 100% of the RPC rated conductivity when connected to interface C.			
					Verification of initialization with soft start/stop performance characteristics shall be performed by test when the initial supply of power is provided to the equipment connected to the RPC(s). Input power to the AP shall be delivered through a PRCU or equivalent. The AP connected to interface C shall be operated with multiple load combinations at levels ranging from 0% to 100% of the RPC rated conductivity.	b) JSC review, inspection and acceptance of attached payload test summaries to assure attached payload compatibility with soft start/stop performance characteristics when the initial supply power is provided to the equipment connected to the RPC(s), input power to delivered through a PRCU or equivalent, and multiple load combinations at levels ranging from 0% to 100% of the RPC rated conductivity when connected to interface C.			
62	IRD SSP 57003	3.2.2.2.4 4.3.2.2.2.4	A	Surge Current	A. The amplitude shall not exceed the values defined in Figure 3.2.2.2.4-1. Surge Current amplitude shall be verified by test and analysis. Input power to the AP should be representative of the ISS power environment. Verification of compatibility with Surge Current limits shall be performed by test at high, nominal, and low input voltage values as specified. The power source used to perform the test shall be capable of providing a range of power between 0 kilowatt (kW) to 3 kW at 112.5–126.	a1) Development and submittal of test and analysis summaries that demonstrate attached payload surge current amplitude input power is representative of the ISS power environment.	A&T		
					The AP EPCE shall be operated under selected loading conditions that envelope operational loading. The analysis shall be performed using test data from the above test. The analysis shall indicate operability and compatibility exist based on test data and the requirements specified in paragraph 3.2.2.2.4. The verification shall be considered successful when test and analysis shows under high, nominal and low voltage conditions the AP can perform all functional capabilities and prove compatibility by operating within the specified limits of paragraph 3.2.2.2.4.	a2) Development and submittal of test summaries that demonstrate attached payload surge current amplitude compatibility with current limits at high, nominal, and low input voltage values with range of power between 0 kilowatt (kW) to 3 kW at 112.5–126.			
						a3) Development and submittal of			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						analyses summaries that demonstrate attached payload EPCE shall be operated under selected loading conditions that envelope operational loading using test data from the above test and assess operability and compatibility exist based on test data and the requirements specified in IRD SSP 57003, paragraph 3.2.2.2.4.			
					B. The rate of current change shall not exceed the values defined in figure 3.2.2.2.4-2. Surge Current rate of current change shall be verified by test and analysis. Input power to the AP should be representative of the ISS power environment.	b1) Development and submittal of analyses summaries that demonstrate attached payload surge current rate of current change is representative of the ISS power environment.			
					Verification of compatibility with Surge Current limits shall be performed by test at high, nominal, and low input voltage values as specified. The power source used to perform the test shall be capable of providing a range of power between 0 kW to 3 kW at 12.5–126.	b2) Development and submittal of test summaries that demonstrate attached payload of compatibility with surge current limits at high, nominal, and low input voltage values capable of providing a range of power between 0 kW to 3 kW at 112.5–126.			
					The AP EPCE shall be operated under selected loading conditions that envelope operational loading. The analysis shall be performed using test data from the above test. The analysis shall indicate that operability and compatibility exist based on test data and the requirements specified in paragraph 3.2.2.2.4.	b3) Development and submittal of analyses summaries that demonstrate attached payload operability and compatibility exist with EPCE operated under selected loading conditions that envelope operational loading using test data from the above test in accordance with IRD SSP 57003, paragraph 3.2.2.2.4.			
					The verification shall be considered successful when test and analysis shows under high, nominal and low voltage conditions the AP can perform all functional capabilities and prove compatibility by operating within the specified limits of paragraph 3.2.2.2.4.	c) JSC review, inspection and acceptance of attached payload surge current analyses and tests to assure surge current amplitude input power is representative of the ISS power environment, demonstration of compatibility with current limits at high, nominal, and low input voltage values with range of power between 0 kilowatt (kW) to 3 kW at 112.5–126 in accordance with loading conditions specified in IRD SSP 57003, paragraph 3.2.2.2.4.			
63	IRD SSP 57003	3.2.2.2.5 4.3.2.2.2.5	A	Reverse Energy/Current	a) The AP electrical interface to primary input power and operational keep alive power shall	a) Development and submittal of analyses that demonstrate attached	A		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					comply with the requirements defined in Table 3.2.2.2.5-1 for reverse energy/current into the upstream power source.	payload compatibility with reverse energy/current limits at 3 kW values corresponding to the AP design, with the power source used to perform the analysis capable of providing a range of power between 0 kW to 3 kW at 112.5–126 Vdc,			
					b) The AP interface shall meet either the reverse energy of the reverse current requirement for all the environmental conditions specified in this document when powered from a voltage source with characteristics specified in para. 3.2.2.1 and 3.2.2.2 with a source impedance of 0.1 ohm. Reverse Energy/Current shall be verified by analysis. t. Verification of compatibility with Reverse Energy/Current limits shall be performed by analysis at 3 kW values corresponding to the AP design.	under selected loading conditions that envelope operational loading in compliance with requirements defined in Table 3.2.2.2.5-1 for the reverse energy/current into the upstream power source from a voltage source with characteristics specified in paragraphs 3.2.2.1 and 3.2.2.2 with a source impedance of 0.1 ohm.			
					The power source used to perform the analysis shall be capable of providing a range of power between 0 kW to 3 kW at 112.5–126 Vdc. The AP shall be analyzed under selected loading conditions that envelope operational loading.	b) JSC review, inspection and acceptance of attached payload compatibility analyses to assure reverse energy/current limits at 3 kW over a range of power between 0 kW to 3 kW at 112.5–126 Vdc under selected loading conditions that			
					The verification will be considered successful when analysis shows that the AP complies with requirements defined in Table 3.2.2.2.5-1 for the reverse energy/current into the upstream power source. Also, when the reverse energy or the reverse current requirement for all environmental conditions specified in this document when powered from a voltage source with characteristics specified in paragraphs 3.2.2.1 and 3.2.2.2 with a source impedance of 0.1 ohm is met.	envelope operational loading in compliance with requirements defined in Table 3.2.2.2.5-1 and paragraphs 3.2.2.1/3.2.2.2 with a source impedance of 0.1 ohm.			
64	IRD SSP 57003	3.2.2.2.6.1 4.3.2.2.2.6.1	A	ISS EPS Circuit Protection Characteristics	A. AP connected to the Interface C electrical interface shall operate and be compatible with the characteristics of the PRCs in Figure 3.2.5-1 as described in SSP 57000 para. 3.2.5. Tests shall be performed to show the Attached Payload connected to an Interface C electrical interface operates and is compatible with the characteristics shown and described in Figure	a1) Development, and submittal of test summaries that demonstrate attached payload connected to an Interface C electrical interface is compatible with the current-limiting and trip curve with the at S3/P3 Attach site locations i	A&T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results	
					3.2.5–1 of SSP 57004,(with the exception that the Auxiliary U.S. Laboratory (USL)) current-limiting and trip curve in Figure 3.2.5–1 applies to both the power feeds at S3/P3 Attach site locations.					
					The tests shall be performed at initiation of power to the Attached Payload and with multiple internal load combinations. The verification shall be considered successful if the test results show the initial current flow, when powered on, to the Attached Payload and current flow during the Attached Payload operations with multiple internal load does not exceed the current magnitude and duration as defined and described in Figure 3.2.5–1 of SSP 57004, (with the exception that the Auxiliary USL) current-limiting and trip curve in Figure 3.2.5–1 applies to both the power feeds at S3/P3 Attach site location.	n accordance with SSP 57004 Figure 3.2.5–1 of SSP 57004 for initiation of power and multiple internal load combinations, with the exception that the Auxiliary U.S. Laboratory (USL)) that ensure multiple internal load do not exceed the current magnitude/and duration defined in Figure 3.2.5–1 of SSP 57004, (with the exception that the Auxiliary USL) current-limiting and trip curve				
					B. Overcurrent protection shall be provided at all points in the system where power is distributed to the lower level (wire size not protected by upstream protection devices) feeder and branch lines	b1) Development, and submittal of analysis and drawings that demonstrate attached payload electrical circuit schematics show overcurrent protection exists at all points in electrical architecture system where power is distributed to lower level (wire size not protected by upstream circuit protection device) feeder and branch lines.				
					Analysis of electrical circuit schematics shall be performed to show overcurrent protection exists at all points in the AP electrical architecture system where power is distributed to lower level (wire size not protected by upstream circuit protection device) feeder and branch lines. The analysis shall be considered successful when results show overcurrent protection exists at each point in the AP electrical architecture system where power is distributed to lower level (wire size) feeder and branch lines.	c) JSC review, inspection and acceptance of attached payload analysis, test summaries, and drawings to assure AP connected to an Interface C electrical interface is compatible with the current-limiting and trip curve with the at S3/P3 Attach site locations for initiation of power/multiple internal load combinations in accordance with Figure 3.2.5–1 of SSP 57004, current-limiting and trip curve and electrical circuit schematics show overcurrent protection exists at all points in electrical architecture system where power is distributed to lower level.				
65	IRD SSP 57003	3.2.2.2.6.2 4.3.2.2.2.6.2	A	Attached Payload Trip Ratings	The AP connected to interface C circuit protection device shall be designed to provide trip coordination as defined in par. 3.2.2.2.6.1.A	a) Development, and submittal of test and demonstration summaries that demonstrate attached payload trip	T&D	CofC		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					The AP Trip Ratings shall be verified by test and demonstration. Input power to the AP shall be representative of the ISS power environment.	ratings are representative of the ISS power environment, performed as specified in paragraph 3.2.2.2.6.1, and show that overcurrent which trips circuit protection in a downstream device will not also trip the protection device upstream.			
					The test and demonstration shall be performed as specified in paragraph 3.2.2.2.6.1. The verification shall be considered successful when test and demonstration of the Attached Payload shows that the overcurrent which trips the circuit protection in a downstream device will not also trip the protection device upstream.	b) JSC review, inspection and acceptance of attached payload test and demonstration summaries that demonstrate attached payload trip ratings are representative of the ISS power environment, performed as specified in paragraph 3.2.2.2.6.1, and show that overcurrent which trips circuit protection in a downstream device will not also trip the protection device upstream.			
66	IRD SSP 57003	3.2.2.2.7 4.3.2.2.7	A	Interface C Attached Payload Complex Load Impedances	The load impedance presented by the attached payload to Interface C shall not exceed the bounds defined by Figures 3.2.2.2.7-1 and 3.2.2.2.7-2 for input over the frequency range of 50Hz to 100 kHz. At frequencies where the magnitude of the component of the attached payload input impedance is less than those defined in Figures 3.2.2.2.7-1/2 (MCAS power interface only), the phase component of the attached payload impedance shall not exceed the bounds defined in Figures 3.2.2.2.7-1/2 (for MCAS power interface only)	a1) Development, and submittal of tests summaries that demonstrate attached payload load impedance meet the amplitude and phase requirements as specified in Figure 3.2.2.2.7-1 and 3.2.2.2.7-2 under conditions of high, nominal, and low voltage to the integrated system.	T		
					AP load impedance shall meet the amplitude and phase requirements as specified in Figure 3.2.2.2.7-1 and 3.2.2.2.7-2. Load impedance shall be tested under conditions of high, nominal, and low voltage to the integrated AP system. The active converters directly downstream shall also be exercised through the complete range of their loading. Selected combinations of converters that can influence the measured load impedance at Interface C shall be tested. The verification shall be considered successful when the test shows that all load impedances measured for high, nominal and low voltage conditions remain within specified limits identified by Note 1 in Figures 3.2.2.2.7-1 and	a2) Development, and submittal of tests summaries that demonstrate attached payload load active converters directly downstream are exercised through the complete range of their loading with selected combinations of converters that can influence the measured load impedance at Interface C tested as specified limits identified by Note 1 in Figures 3.2.2.2.7-1 and 3.2.2.2.7-2.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					3.2.2.2.7-2.				
						b) JSC review, inspection and acceptance of attached payload tests summaries to assure load impedance amplitude/phase requirements are in accordance with Figure 3.2.2.2.7-1, and 3.2.2.2.7-2 under conditions of high, nominal, and low voltage to the integrated system and active converters directly downstream are exercised through the complete range of their loading with selected combinations of converters that can influence the measured load impedance at Interface C.			
67	IRD SSP 57003	3.2.2.2.8	A	Large Signal Stability	The AP connected to Interface C shall maintain the stability with the EPS interface by damping a transient response to 10% of the maximum response within 1.0 milliseconds and remaining 10% thereafter when the rise time/fall time (between 10 and 90% amplitude) of the input voltage is less than 10 microseconds and the voltage pulse is varied from 100 to 150 microseconds in duration.	a1) Development and submittal of testing summaries that demonstrate attached payload large signal stability show transient responses, measured at the input to the Attached Payload, diminish to 10 percent of the maximum amplitude within 1.0 milliseconds and remain below 10 percent thereafter	A&T		
					Large signal stability shall be verified by test and analysis. A large signal stability test shall be conducted for the Attached Payload connected to Interface C. An integrated analysis shall be provided for representative maximum and minimum power loading to demonstrate that impedance variations will not impact system stability.	a2) Development and submittal of testing summaries that demonstrate attached payload large signal stability connected to Interface C demonstrates impedance variations do not impact system stability, with input/ transient response waveform recorded from pulse start through diminished transient with pulses of 100, 125 and 150 microsecond (±10 microsecond) duration applied.			
					The input and transient response waveform for the Attached Payload shall be recorded from the start of the pulse through the time when the transient diminishes to and remains below 10 percent of the maximum amplitude of the response. The required test conditions may be produced using a programmable power source or the test configuration shown in Figure 3.2.2.2.8-1.	b) JSC review, inspection and acceptance of attached payload testing summaries that demonstrate large signal stability transient responses diminish to 10 percent of the maximum amplitude within 1.0 milliseconds			
					The 25 amp ISS Line Impedance Simulation Network (LISN) or equivalent shown in Figure	and remain below 10 percent thereafter when connected to Interface C with			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					4.3.2.2.2.8-2 will be used. The pulse generator/amplifier must provide a source impedance of less than 0.2 ohms from 100 Hz to 10 kHz to the 2 ohm load of the primary side of the pulse transformer.	input/ transient response waveform recorded from pulse start through diminished transient with pulses of 100, 125 and 150 microsecond ( $\pm 10$ microsecond) duration applied.			
					Pulses of 100, 125 and 150 microsecond ( $\pm 10$ microsecond) duration shall be applied. The pulse amplitude at the secondary side of the injection transformer should be between 10 and 15 Volts. Pulse rise and fall times must not exceed 10 microseconds between 10 and 90 percent of the pulse amplitude.				
					The resulting transient responses must remain within the EPS normal transient limits. The test and analysis shall be considered successful when results show transient responses, measured at the input to the Attached Payload, diminish to 10 percent of the maximum amplitude within 1.0 milliseconds and remain below 10 percent thereafter.				
68	IRD SSP 57003	3.2.3.3.2.1 4.3.2.2.3.1	A	Wire Derating	Derating criteria for loads and downstream of AP PI shall be per TM 102179 as interpreted by TA-92-038. Wire Derating shall be verified by analysis. Analysis of the AP electrical power schematics shall be performed to show that the wire gauge at the AP to ISS power interface or AP EPCE meets the requirement of paragraph 3.2.2.3.1. The verification shall be considered successful when the analysis shows the AP to ISS power interface or AP EPCE meets Wire Derating requirement as specified in paragraph 3.2.2.3.1.	a) Development and submittal of analysis summary that demonstrates AP electrical power schematics/wire gauge at ISS power interface/EPCE meet Wire Derating requirement as specified in paragraph 3.2.2.3.1. b) JSC review, inspection and acceptance of AP analysis summary to assure attached payload electrical power schematics/wire gauge at ISS power interface/EPCE meet Wire Derating requirement as specified in paragraph 3.2.2.3.1.	A	CofC	
69	IRD SSP 57003	3.2.2.3.2 4.3.2.2.3.2	A	Exclusive Power Feeds	AP shall utilize feeds dedicated to a specific S3/P3 attach site location only. The AP design with exclusive power feeds shall be verified by demonstration and inspection. The demonstration shall be considered successful when the result shows each individual AP will be provided power from its dedicated AP to ISS power interface location and no intra-site cabling exists. The inspection shall be considered successful when the result shows each individual S3/P3 attach site input power cabling will interface to a dedicated AP to ISS power interface and no cabling from external sources exist.	a) Development and submittal of demonstration and inspection summaries that demonstrate attached payload with exclusive power feeds are provided power from S3/P3 attach site input power cabling dedicated AP/ISS power interface and no intra-site cabling exists.. b) JSC review, inspection and acceptance of attached payload demonstration and inspection summaries to assure attached payload with exclusive power feeds are provided power from S3/P3 attach site	D&I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						input power cabling dedicated Attached Payload/ISS power interface and no intra-site cabling exists.			
70	IRD SSP 57003	3.2.2.3.3 4.3.2.2.3.3	A	Loss of Power	<p>Payloads shall fail safe in the event of a total or partial loss of power in accordance with NSTS 1700.7B ISS Addendum.</p> <p>Verification that the AP equipment connected to Interface C meets the loss of power safety requirements specified in NSTS 1700.7 ISS Addendum shall be performed and submitted to the PSRP in accordance with NSTS 13830.</p> <p>Verification shall be considered successful when hazard reports and safety data presented to the PSRP during the phased safety reviews are approved.</p>	<p>a) Development, and submittal of analysis that demonstrate attached payload equipment connected to Interface C meets the loss of power safety requirements specified in NSTS 1700.7 ISS Addendum.</p> <p>b) JSC review, inspection and PSRP acceptance of attached payload hazard assessment with analysis that ensures attached payload equipment connected to Interface C loss of power does not result in a hazard.</p>	Safety and HR SVM References	CofC	Does this address loss of Shuttle power?
71	IRD SSP 57003	3.2.2.4 4.3.2.2.4	A	EMC	<p>The requirements of SSP 30243, Space Station Requirements for Electromagnetic Compatibility, paragraphs 3.1 and 3.6.2 shall be verified by test and analysis.</p> <p>The test shall be considered successful when results show the Attached Payload connected to Interface C meet the requirements specified in SSP 30243 paragraph 3.6.2.</p> <p>The results of the EMC test shall be documented in the EMC test plan/report.</p>	<p>a1) Development and submittal of test summary that demonstrate attached payload meets paras. 3.1/3.6.2 of SSP 30243 and documented in the EMC test plan/report.</p> <p>a2) Analysis and testing to demonstrate controls for bonding/grounding, power quality, compatibility, EMI, EME, static discharge control, and EM susceptibility</p> <p>a3) Testing to verify operational modes</p>	A&T - including cables		
					<p>The analysis shall be documented in an EMC Control Plan and Design Analysis Report.</p> <p>The analysis shall include determining the necessary requirements for equipment not connected directly to Interface C such that the entire payload meets the EMC requirements of this IRD.</p> <p>The analysis shall be considered successful when results show that requirements defined in paragraph 3.1 of SSP 30243 have been met.</p>	<p>a4) Development and submittal of analysis summary that determine and demonstrate attached payload EMC requirements for equipment not connected directly to Interface C such that the entire payload meets the EMC requirements defined in SSP 30243 paragraph 3.1.</p> <p>b) JSC review, inspection and acceptance of attached payload test and analysis summary to ensure paras. 3.1/3.6.2 of SSP 30243 are met and documented in the EMC test plan/report.</p>			
72	IRD SSP 57003	3.2.2.4.1 4.3.2.2.4.1	A	Electrical Grounding	<p>The AP connected to Interface C shall meet all requirements specified in SSP 30240, section 3.</p> <p>The Electrical Grounding of the Attached Payload EPCE shall be verified by test and analysis.</p> <p>The test shall be considered successful when the results show that Attached Payload</p>	<p>a1) Development and submittal of analysis and test summaries that show EPCE electrical grounding is in compliance with the requirements of SSP 30240, section 3.</p> <p>a2) AP design review and testing to assure intentional electrical current</p>	A&T - based on end item qual data vs. grounding		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					grounding is in compliance with the requirements in section 3 of SSP 30240, Space Station Requirements Grounding.	from flowing in ground. a3) AP electrical design and testing demonstrates that electromagnetic environment due to grounding is not configuration dependent.			
						a4) AP equipment external electrical signal and power grounds shall be dc isolated from each other at the Orbital Replaceable Unit (ORU) level. a5) AP separately derived electrical power source shall be electrically connected to structure at no more than one point.			
					The analysis shall be based on end item qualification data and Attached Payload EPCE design and analysis data. The analysis shall be considered successful when the data shows the Attached Payload EPCE is electrically grounded within the requirements of section 3 of SSP 30240.	a6) AP analog and digital signal grounds external to a system, subsystem, or equipment shall be electrically isolated from each other at the ORU level. b) JSC review, inspection and acceptance of attached payload analysis, test summaries, and drawings that show EPCE electrical grounding is in compliance with the requirements of SSP 30240, section 3.			
73	IRD SSP 57003	3.2.2.4.2 4.3.2.2.4.2	A	Electrical Bonding	Electrical bonding of the AP connected to Interface e C shall be in accordance with SSP 30245 and NSTS 1700.7B, ISS Addendum paras. 213 and 220 Electrical bonding of the AP shall include providing a Class R bond at the attached payload guide pin interface with the guide vane assembly at the final berthed position, for the fully mated , preloaded and deflected system The Electrical Bonding of the AP EPCE shall be verified by Test, Analysis and Inspection. The test shall be considered successful when the results show the requirements of SSP 30245 and the requirements of NSTS 1700.7 ISS Addendum in sections 213 and 220 are met. The analysis shall be based on end item qualification data and AP EPCE design and analysis data.	a1) Development, and submittal of analysis that demonstrate attached payload test summaries show the requirements of SSP 30245 and the requirements of NSTS 1700.7 ISS Addendum in sections 213 and 220 are met. a2) Development, and submittal of analysis that demonstrate attached payload analyses summaries (based on end item qualification data and EPCE design/analysis data and including class R bond at the Guide Pin to Guide Vane interface) shows EPCE is electrically bonded within the requirements of SSP 30245 and the requirements of NSTS 1700.7 ISS Addendum (sections 213/220) are met including a review of design drawings, design and analysis, applicable test data	I,A,&T - Test and analysis report per SSP 30245 and NHB 1700.7	CofC	
					The analysis shall be considered successful when the data shows the AP EPCE is electrically bonded within the requirements of	a3) Development, and submittal of analysis that demonstrate attached payload analyses summaries addressing			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					SSP 30245 and the requirements of NSTS 1700.7 ISS Addendum in sections 213 and 220 are met. The inspection shall be based on the AP EPCE design drawings and any applicable analysis and test reports. The inspection shall be considered successful when the requirements of SSP 30245 and the requirements of NSTS 1700.7 ISS Addendum in sections 213 and 220 are met.	guide pins meet material and surface preparation/finish requirements/dimensions of SSP 30245, paras. 3.2.1.2/3.3.4/3.3.5/3.3.6 and SSP 57004, figure 3.1.2.2-1 and the PAS interface stiffness requirement specified in IRD SSP 57003 paragraph 3.1.3.1.3.2.			
					The class R bond at the Guide Pin to Guide Vane interface shall be verified by Analysis. The analysis shall include a review of AP design drawings, design and analysis data and any applicable test data. The analysis shall be considered successful when the data shows that the AP Guide Pins meet the material and surface preparation/finish requirements of SSP 30245, paragraphs 3.2.1.2, 3.3.4, 3.3.5 and 3.3.6, the Guide Pin dimensions meet the requirements of SSP 57004, figure 3.1.2.2-1 and the AP PAS interface stiffness meets the requirement specified in paragraph 3.1.3.1.3.2 of this document.	a4) Development, and submittal of inspection summaries that demonstrate attached payload EPCE design drawings and applicable analysis and test reports are in accordance with SSP 30245 and NSTS 1700.7 ISS Addendum (sections 213/220).			
					Note: An AP interface meeting these requirements is considered capable of achieving a class R bond at the Guide Pin to Guide Vane interface based on the results of the CAS Interface Class R Bonding Test documented in test report MDC 02H1044, Common Attach System Interface Class R Bonding Test Report.				
74	IRD SSP 57003	3.2.2.4.3 4.3.2.2.4.3	A	Cable/Wire Design and Control Requirements	Cabling between payload electrical power consuming equipment and Interface C shall meet all cable and wire design requirements of SSP 30242. The Cable and Wire Design of the Attached Payload EPCE external cables shall be verified by Test, Analysis, or Inspection. The test shall be considered successful when the results show all requirements of SSP 30242, Space Station Cable/Wire Design and Control Requirements for Electromagnetic Compatibility, are met. The analysis shall be based on AP design and analysis data. The analysis shall be considered successful when the results show all requirements of SSP 30242 are met.	b) JSC review, inspection and acceptance of attached payload to ensure that attached payload analysis, test, and inspection summaries meet the requirements of SSP 30245 (paras. 3.2.1.2/3.3.4/3.3.5/3.3.6), IRD SSP 57003 (paragraph 3.1.3.1.3.2), and NSTS 1700.7 ISS Addendum (sections 213/220).	A&T, A&I - per SSP 30242		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					The inspection shall be based on physical/visual indications of the AP EPCE. The inspection shall be considered successful when physical/visual indications show that external cable and wire design is in compliance with the requirements can normally be met by inspection of drawings and hardware. Analysis is required to determine impedance and sensitivity characteristics of the circuit when classification cannot be determined by examination of the circuit known characteristics.				
					Note: SSP 30242 harness requirements can normally be met by inspection of drawings and hardware. Analysis is required to classify signals and determine the necessary isolation between signals. Test may be required to determine impedance and sensitivity characteristics of the circuit when classification cannot be determined by examination of the circuit known characteristics.				
					APs shall meet all EMI requirements of SSP 30237The Electromagnetic Interference of the Attached Payload EPCE shall be verified by test and analysis. Tests shall be performed and data submitted for conducted susceptibility and radiated susceptibility, in addition to that for conducted emissions and radiated emissions. This data shall be evaluated against the limits of SSP 30237. The test shall be considered successful when the tests are performed using SSP 30238 and the results show requirements of SSP 30237 are met by the AP.				
75	IRD SSP 57003	3.2.2.4.4 4.3.2.2.4.4	A	EMI	The test results shall be documented in the EMI test plan/report. The analysis of each AP to ISS power interface shall be performed using equipment test data as mentioned in the above paragraph. The analysis shall be considered successful when the results show requirements of SSP 30237 are met by the AP.	a1) Development, and submittal of EMI EPCE test summary that demonstrate attached payload conducted/radiated susceptibility/emissions using SSP 30238	A&T- including test configuration and equipment		
					This analysis includes evaluating the degree of isolation from 30 Hz to 400 MHz provided by the AP EPCE for power ripple and transients to the equipment using isolated power.	a2) Development, and submittal of EMI EPCE analysis summary that demonstrate attached payload conducted/radiated			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					An analysis of the isolation in conjunction with the equipment conducted requirements should be submitted in the EMC Control Plan to verify the requirements of this IRD are met. Note: EMI test plan/report details are located in SSP 57013.	susceptibility/emissions are in accordance with the limits of SSP 30237 based on EPCE test results. This analysis includes evaluating the degree of isolation from 30 Hz to 400 MHz provided by the Attached Payload EPCE for power ripple and transients to the equipment using isolated power. b) JSC review, inspection and acceptance of attached payload conducted/radiated susceptibility/emissions test and analysis summaries.			
76	IRD SSP 57003	3.2.2.4.5 4.3.2.2.4.5	A	ESD	AP EPCE that may be damaged by ESD between 4k and 15k volts shall have a label affixed to the case in the location clearly visible in the installed position. Labeling of AP EPCE to ESD up to 15k volts shall be in accordance with MIL-STD-1686.	a) Development and submittal of inspection results that demonstrate attached payload unpowered EPCE labeling is verified by inspection that includes susceptible to ESD up to 15000 V is in accordance with MIL-STD-1686A.	A - NVR per SSP 57213	CofC	
					The labeling of unpowered AP EPCE shall be verified by inspection. The inspection shall be considered successful when physical/visual indications show the labeling of APayload EPCE susceptible to ESD up to 15000 V is in accordance with MIL-STD-1686A.	b) JSC review, inspection and acceptance of attached payload inspection results that demonstrate unpowered EPCE labeling is verified and is in accordance with MIL-STD-1686A.			
77	IRD SSP 57003	3.2.2.4.6 4.3.2.2.4.6	A	AC Magnetic Fields	The AC Magnetic Fields requirement for the AP connected to Interface C, including cables and interconnecting wiring, shall be verified by test. The test shall be performed using the MIL-STD-462D, Measurement of EMI Characteristics, RE01 Method with the following modifications: The AP generated magnetic field measured at a distance of 7 cm for the external surfaces of the attached payload shall not exceed 140 dB above 1 picotesla at a distance of 7 cm from the surfaces of the attached payload for frequencies ranging from 30 hz to 2kHz, then falling 40 dB per decade to 50 Hz.	a) Development, and submittal of test summary demonstrate attached payload AC magnetic fields connected to Interface C ( including cables and interconnecting wiring) in accordance with MIL-STD-462D, setup guidelines per SSP 30238, measurements required from 30 Hz to 50 kHz, and recording of emissions greater than 20 dB below the specified limits.	T		
					A. Test setup guidelines shall be per SSP 30238, Space Station Electromagnetic Techniques, Figure 3-9 or 3-10, not the setup identified by MIL-STD-462D.	The verification shall be considered successful when test results show the generated ac magnetic fields of the Attached Payload connected to Interface C, including cables and interconnecting wiring, do not exceed			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						140 dB above 1 picotesla between 30 Hz to 2 40 dB per decade to 50 kHz.			
					B. Guidelines of SSP 30238, Figure 3–9 and 3–10, requirement of 1 meter separation does not apply to RE01.	b) JSC review, inspection and acceptance of attached payload test report that assures that AC magnetic fields do not exceed 140 dB above 1 picotesla between 30 Hz to 2 40 dB per decade to 50 kHz.			
					C. Measurements are required from 30 Hz to 50 kHz rather than 100 kHz required by MIL–STD–461D, Electromagnetic Emission and Susceptibility Requirements for Control of Electromagnetic Interference.				
					D. Measurements are performed at 7 cm from the generating equipment. In the event emissions are out–of–specification, measurements are performed at 50 cm from the generating equipment.				
					E. Emissions greater than 20 dB below the specified limits shall be recorded in the EMI test report. In cases where the noise floor and ambient are not 20 dB below specified level, only those emissions above the noise floor/ambient are required to be recorded. The verification shall be considered successful when test results show the generated ac magnetic fields of the Attached Payload connected to Interface C, including cables and interconnecting wiring, do not exceed 140 dB above 1 picotesla between 30 Hz to 2 40 dB per decade to 50 kHz.				
78	IRD SSP 57003	3.2.2.4.7 4.3.2.2.4.7	A	DC Magnetic Fields	The AP generated dc magnetic fields shall not exceed 170 Db picotesla at a distance of 7 cm from the external surfaces of the attached payload. This applies to electromagnetic and Permanente magnetic devices. The DC magnetic fields requirement for AP with electromagnetic and/or permanent magnetic devices shall be verified by test or analysis.	a) Development and submittal of analysis/test summary that demonstrate attached payload The DC magnetic fields (with electromagnetic and/or permanent magnetic devices) are verified by test or analysis and measurement of	A&T - 57213 Exception E6		
					The measurement or analysis of DC magnetic fields shall be performed if there is a DC magnetic field greater than 170 dB above 1 picotesla. Additional measurements or analysis shall be performed at 10 cm increments away	magnetic fields completed if there is a DC magnetic field greater than 170 dB above 1 picotesla and performed at 10 cm increments from the generating equipment until data proves the DC			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					from the generating equipment until data proves the DC magnetic fields are 6 dB below the 170 dB above 1 picotesla requirement. The verification shall be considered successful when test or analysis results show the generated dc magnetic fields of the AP do not exceed 170 dB above 1 picotesla at a distance of 7 cm from the external surfaces of the AP. The includes electromagnetic and permanent magnetic devices.	magnetic fields are 6 dB below the 170 dB above 1 picotesla requirement.			
					b) JSC review, inspection and acceptance of AP analysis shows the requirement has been met.	b) JSC review, inspection and acceptance of AP test or analysis results show the generated dc magnetic fields do not exceed 170 dB above 1 picotesla at a distance of 7 cm from the external surfaces of the Attached Payload (including electromagnetic and permanent magnetic devices.)			
79	IRD SSP 57003	3.2.2.4.8 4.3.2.2.4.8	A	Corona	AP electrical and electronic subsystems, equipment, and systems shall be designed to preclude damaging or destructive corona in its operating environment.	a1) Electrical testing and analysis per MSFC-STD-531 that demonstrates design controls used to preclude corona hazards a2) Design review of hardware and drawing to demonstrate controls to preclude corona concerns. a3) Development, and submittal of test summary that demonstrates attached payload equipment with voltages (steady-state, transient, internal, or external) greater than 190 volts do not create permanent damaging effects or hazardous conditions due to destructive corona will exist in the partial pressure environment above 1.93E-05 pounds per square inch absolute (psia) (1.0E-03 Torr).	T		
					AP equipment with voltages (steady-state, transient, internal, or external) greater than 190 volts shall be verified by test to the degree necessary to ensure no permanent damaging effects and no hazardous conditions due to destructive corona will exist in the partial pressure environment above 1.93E-05 pounds per square inch absolute (psia) (1.0E-03 Torr). The fault clearing and protection transient voltage limits defined in Paragraph 3.2.2.1.3.2-1 is not considered the equipment voltage.	b) JSC review, inspection and acceptance of attached payload corona test summary to ensure voltages greater than 190 volts do not create permanent damaging effects or hazardous conditions in partial pressure environment above 1.93E-05 pounds per square inch absolute (psia) (1.0E-03 Torr).			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
80	IRD SSP 57003	3.2.2.4.9 4.3.2.2.4.9	A	EMI Susceptibility for safety critical circuits	AP safety critical circuits shall meet the margins defined in SSP 30243. Safety critical circuits should be verified by test and analysis. The analysis shall be considered successful when the results show the requirements of SSP 30243, paragraph 3.2.3 are met by the Attached Payload.	a1) Analysis and testing to demonstrate controls for bonding/grounding, power quality, compatibility, EMI, EME, static discharge control, and EM susceptibility a2) end item testing a3) acceptance testing a4) Testing to verify operational modes	A&T		
						a5) Development, and submittal of test and analysis summaries that demonstrate attached payload safety critical circuits show compliance with SSP 30243, paragraph 3.2.3. b) JSC review, inspection, and acceptance of attached payload test and analysis summaries to ensure safety critical circuits show compliance with SSP 30243, paragraph 3.2.3.			
81	IRD SSP 57003	3.2.5.1 4.3.2.2.5.1	A	Payload Electrical Safety	The AP shall meet the electrical safety requirements defined in NSTS 1700.7B ISS addendum. Verification shall be by analysis. The analysis showing that the AP meets the requirements of NSTS 1700.7 ISS Addendum shall be submitted to the PSRP in accordance with NSTS 13830. Verification shall be considered successful when hazard reports and safety data presented to the PSRP during the phased reviews are approved.	a1) Design review of wire size and fuse to assure compliance with TA-92-038 a2) Acceptance, qualification and thermal testing to verify that all circuit safety devices function in derated environment a3) Submittal of analysis that demonstrate AP electrical safety meets the requirements of NSTS 1700.7 ISS Addendum Requirements. b) PSRP review, inspection and acceptance of attached payload electrical safety analysis.	A	CofC	
82	IRD SSP 57003	3.2.2.5.1.1 4.3.2.2.5.1.1	A	Mating/Demating of powered connectors	Prior to mating/demating to/from PAS/UCCAS active half, the AP shall comply with requirements of letter MA2-99-170. The AP shall provide verification of the inhibit status at the time the inhibit is inserted. Verification that the AP for mating/demating of powered connectors specified in NSTS 18798, MA2-99-170, Crew Mating/Demating of Powered Connectors, shall be performed and submitted to the PSRP in accordance with NSTS 13830.	a) Development, and submittal of analysis that demonstrate attached payload powered connector mating/demating is in accordance with Letter MA2-99-170.	Safety and HR SVM References	CofC	
					Verification shall be considered successful when hazard reports and safety data presented to the PSRP during the phased safety reviews	b) JSC PSRP review, inspection and acceptance of attached payload hazard assessment.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					are approved.				
83	IRD SSP 57003	3.2.2.5.1.2 4.3.2.2.5.1.2	A	Safety Critical Circuits Redundancy	The AP connected to Interface C shall meet the safety critical redundancy requirements of NSTS 18798. Verification that the Attached Payload equipment connected to Interface C meets the loss of power safety requirements specified in NSTS 1700.7 ISS Addendum shall be performed and submitted to the PSRP in accordance with NSTS 13830. Verification shall be considered successful when hazard reports and safety data presented to the PSRP during the phased safety reviews are approved.	a1) Design review, analysis and testing to demonstrate that redundant safety critical circuits are routed in separate cable bundles per ET12-909-115 a2) Development and submittal of analysis that demonstrate attached payload equipment connected to Interface C meets the loss of power safety requirements specified in NSTS 1700.7 ISS Addendum.	Safety and HR SVM References	CofC	
						a3) Design and testing to verify upstream inhibit and monitoring, means to minimize downstream loads a4) Design to include connector attributes to have powered side in socket and scoop proof connector			
						b1) Crew or ground monitoring available to assure that inhibits are inserted prior to connector manipulation) JSC PSRP review, inspection and acceptance of attached payload analysis that demonstrates attached payload equipment connected to Interface C meets the loss of power safety requirements specified in NSTS 1700.7 ISS Addendum			
84	IRD SSP 57003	3.2.2.5.2 4.3.2.2.5.2	A	Power Switches/Controls	A. Switches/controls of the attached payload connected to Interface C performing on/off power functions shall open (deadface) all supply current conductors except for the power return and the equipment grounding connector. Verification shall be by analysis and test of the Attached Payload switches/controls connected to Interface C performing on/off power functions. Verification shall be considered successful when the analysis and test confirm that the on/off functions open (dead-face) all supply circuit conductors except the power return and the equipment grounding conductor while in the power-off position.	a) Development and submittal of analysis and test summaries that demonstrates attached payload switches/controls connected to Interface C performing on/off power functions confirm that the on/off functions open (dead-face) all supply circuit conductors except the power return and the equipment grounding conductor while in the power-off position.	A&T, A, I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. The attached payload power-off markings and/or indications shall be used only if all parts, with the exception of overcurrent devices and EMI filters, are disconnected from the supply current	b) Development and submittal of analysis summaries that demonstrate attached payload design drawings confirm power-off markings and/or indications are used only if all parts, with the exception of overcurrent devices and associated EMI filters, are disconnected from the supply circuit.			
					An analysis of the Attached Payload design drawings shall be performed to verify that power-off markings and/or indications are used only if all parts, with the exception of overcurrent devices and associated EMI filters, are disconnected from the supply circuit. Verification shall be considered successful when the analysis confirms the equipment has been met.				
					C. The AP standby, charging, or other appropriate nomenclature shall be used to indicate that the supply circuit is not completely disconnected for this power condition. Verification shall be by inspection. The AP design drawings shall be inspected to verify that standby, charging or other appropriate nomenclature was used to indicate that the supply circuit is not completely disconnected for this power condition. Verification shall be considered successful when the inspection verifies that the proper nomenclature was used.	c) Development and submittal of inspection summaries of attached payload switches/controls drawings to confirm nomenclature for standby, charging or other appropriate nomenclature used to indicate that supply circuit is not completely disconnected for this power condition. d) JSC review, inspection and acceptance of AP analyses, testing, and inspection summaries to assure payload switches/controls connected to Interface C performing on/off power functions are in place.			
85	IRD SSP 57003	3.3 4.3.3.1	A	CADH Interface with Mobile Servicing System	Applicable paragraphs of this document shall be considered a part of this paragraphs requirements. Verification of the Attached Payload interface to the UMA shall be by test. Verification shall be considered successful when the test shows that the Attached Payload can transmit and receive data from the ISS in accordance with SSP 42004, paragraph B3.2.2.6.	a) Submittal of test summary that demonstrate attached payload interface to the UMA shows ISS data is transmitted/received data in accordance with SSP 42004, paragraph B3.2.2.6. b) JSC review, inspection and acceptance of attached payload test summary in accordance with SSP 42004, paragraph B3.2.2.6 to ensure interface to the UMA provides ISS transmitted/received data.	T	CofC	
86	IRD SSP 57003	3.1 3.3.2.1.1 4.3.3.2.1.1	A	Word/Byte Notations	The AP connected to the S3 or the P3 LRDL or HRDL shall use the word/byte notations as specified in SSP 52050, part 1, para. 3.1.1.. Verification of the Attached Payload word/byte	a) Development, and submittal of test and inspection summaries that demonstrate attached payload word/byte notations consist of	I&T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					notations shall be by inspection and test.	word/byte notations conform with paragraph 3.1.1, Notations of SSP 52050 and when the AP communicates on the required telemetry links with the PRCU, STEP, or equivalent.			
					The inspection shall consist of a review of the word/byte notations in the unique payload software ICD and should be considered successful when it is shown that the word/byte notations used in that ICD conform with paragraph 3.1.1, Notations of SSP 52050. Verification shall be considered successful when the AP communicates on the required telemetry links with the PRCU, STEP, or equivalent.	b) JSC review, inspection and acceptance of attached payload test and inspection summaries to assure word/byte notations in accordance with SSP 52050, para. 3.1.1 and when the AP communicates on the required telemetry links with the PRCU, STEP, or equivalent.			
87	IRD SSP 57003	3.3.2.1.2 4.3.3.2.1.2	A	Data Types	The AP connected to the S3 or the P3 LRDL or HRDL shall use the data types as specified in SSP 52050, para. 3.2.1, or Appendix J, Legal Data Types in D684-10056-01 The AP who have data that is transmitted ground to space or from the S3/P3 attach sited to the payload MDM shall utilize CCSDS packets Verification of the AP data types shall be by inspection.	a) Development, and submittal of inspection summaries that demonstrate attached payload data types are consistent with SSP 52050, paragraph 3.2.1 and subparagraphs.	I	CofC	
					The inspection shall consist of a review of the data types against paragraph 3.2.1 and subparagraphs, Data Formats, of SSP 52050. Verification shall be considered successful when it is shown that the data types in the unique AP software ICD conforms with paragraph 3.2.1 and subparagraphs, Data Formats, of SSP 52050.	b) JSC review, inspection and acceptance of attached payload inspection summaries to ensure attached payload data types are consistent with SSP 52050, paragraph 3.2.1 and subparagraphs.			
88	IRD SSP 57003	3.3.2.1.3 4.3.3.2.1.3	A	LRDL/HRDL Data Transmissions	A. The AP data transmitting data on the LRDL, MIL-STD-1553 bus shall use the data transmission order in accordance with D684-10056-01, Prime Contractor software Standards and Procedures Specifications Verification of the LRDL transmissions shall be by inspection. The inspection shall consist of a review of the LRDL data transmissions against paragraph 3.4, Non-Signal Data Coding Standards, of D684-10056-01.	a) Development and submittal of attached payload inspection summaries that consist of a review of the LRDL data transmissions against D684-10056-01, para. 3.4 (Non-Signal Data Coding Standards) to verify word/byte conformance with SSP 52050 paragraphs 3.1.2/3.4.	I	CofC	
					Verification shall be considered successful when it is shown that the word/byte notations in the unique payload software ICD conforms with SSP 52050, paragraph 3.1.2 and paragraph 3.4,	b) Development and submittal of attached payload inspection summaries that consist of review n of HRDL transmissions against CCSDS 701.0-B-2, paragraph 1.6, Bit Numbering			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Non-Signal Data Coding Standards, of D684-10056-01.	Convention and Nomenclature to verify word/byte notations conforms with SSP 52050, paragraph 3.4.1			
					B. The AP data transmitting data on the HRDL shall use the data transmission order in accordance with CCSDS 701.0-B-2, Advance Orbiting Systems, Network and Data Links: Architectural Specification, Blue Book, Para. 1.6 Verification of the HRDL transmissions shall be by inspection.	c) JSC review, inspection and acceptance of attached payload attached payload inspection summaries that consist of a review of the LRDL data transmissions against D684-10056-01, para. 3.4 (Non-Signal Data Coding Standards) and HRDL transmissions against CCSDS 701.0-B-2, paragraph 1.6 to verify word/byte conformance with SSP 52050 paragraphs 3.1.2/3.4/3.4.1			
					The inspection shall consist of a review of the HRDL data transmissions against paragraph 1.6, Bit Numbering Convention and Nomenclature, of CCSDS 701.0-B-2. Verification shall be considered successful when it is shown that the word/byte notations in the unique payload software ICD conforms with SSP 52050, paragraph 3.4.1 paragraph 1.6, Bit Numbering Convention and Nomenclature, of CCSDS 701.0-B-2.				
89	IRD SSP 57003	3.3.2.2.1 4.3.3.2.2.1	A	Consultative Committee for Space Data Systems Data	A. Verification of the Attached Payload CCSDS data that is transmitted from space to ground shall be by analysis or test. The analysis shall consist of a review of the CCSDS data in the software design documentation. The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 formats.	a) Development and submittal of analysis, test, and inspection summaries that demonstrate attached payload CCSDS data is consistent with SSP 52050 formats for PRCU, STEP, or equivalent and shows that in the software design documentation is in CCSDS data packet format.	A or T	CofC	
					Analysis shall be considered successful when it is shown that in the software design documentation the Attached Payload data which is transmitted space to ground is CCSDS data packet format. Test shall be considered successful when the PRCU, STEP or equivalent correctly receives the Attached Payload CCSDS data.	b) Development and submittal of analysis, test, and inspection summaries that demonstrate attached payload CCSDS data transmitted ground to space or from the S3/P3 Attach Sites to the Payload MDM are consistent with SSP 52050 format and consist of a data transmission with the PRCU, STEP, or equivalent when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data.			
					B. Verification of the AP CCSDS data that is	C) JSC review, inspection and			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					transmitted ground to space or from the S3/P3 Attach Sites to the Payload MDM shall be by analysis or test. The analysis shall consist of a review of the CCSDS data in the software design documentation. The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 format.	acceptance of attached payload analysis, test, and inspection summaries that demonstrate attached payload CCSDS data is consistent with SSP 52050 formats for PRCU, STEP to S3/P3 Attach Sites/Payload MDM and correctly receives the Attached Payload CCSDS data.			
					Analysis shall be considered successful when it is shown that in the software design documentation the AP data which is transmitted ground to space or from the S3/P3 attach sites to the payload MDM are CCSDS data packets. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data.				
90	IRD SSP 57003	3.3.2.2.1.1 4.3.3.2.2.1.1	A	Consultative Committee for Space Data Systems Data Packets	The AP shall develop data packets in accordance with SSP 52050, para. 3.1.3. Verification of the Attached Payload CCSDS data packet shall be by inspection and test. Inspection shall be considered successful when it is shown that the CCSDS data packets in the unique Attached Payload software ICD conforms with SSP 52050 and SSP 57002.	a) Development and submittal of test and inspection summaries demonstrate attached payload CCSDS data packet conforms with SSP 52050, para 3.1.3 and SSP 57002 and PRCU, STEP, or equivalent correctly receives the CCSDS data packets.	A&T	CofC	
					Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data packets.	b) JSC acceptance of attached payload to assure test and inspection summaries demonstrate attached payload CCSDS data packet conforms with SSP 52050 and SSP 57002 and PRCU, STEP, or equivalent correctly receives the CCSDS data packets.			
91	IRD SSP 57003	3.3.2.2.1.1.1 4.3.3.2.2.1.1.1	A	Consultative Committee for Space Data Packet Data Systems Primary Header	The attached payload shall develop a CCSDS primary header in accordance with SSP 52050 , para 3.1.3.1. Verification of the Attached Payload CCSDS primary header shall be by inspection and test. The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 formats.	a) Development, and submittal of test and inspection summaries that demonstrate attached payload CCSDS primary header consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data in accordance with SSP 52050 , para 3.1.3.1 formats and when the PRCU, STEP, equivalent correctly receives the CCSDS primary header.	A&T	CofC	
					Test shall be considered successful when the PRCU, STEP, equivalent correctly receives the	b) JSC review, inspection and acceptance of attached payload test and			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Attached Payload CCSDS primary header.	inspection summaries to ensure CCSDS primary header consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 formats and when the PRCU, STEP, equivalent correctly receives the CCSDS primary header.			
92	IRD SSP 57003	3.3.1.2.2.1.1.2 4.3.3.2.2.1.1.2	A	Consultative Committee for Space data Systems Data Secondary Header	A. The AP shall develop a CCSDS secondary header immediately following the CCSDS primary header. Verification of the Attached Payload CCSDS secondary header shall be test.	a) Development and submittal of test summaries that demonstrate attached payload CCSDS secondary header data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted secondary header receives the AP CCSDS secondary header in accordance with SSP 52050, para. 3.1.3.2.	T	CofC	
					The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted secondary header immediately following the CCSDS primary header. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS secondary header.				
					B. The AP secondary header shall develop in accordance with SSP 52050 , para 3.1.3.2Verification of the Attached Payload CCSDS secondary header shall be by test. The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 formats. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS secondary header.	b) Submittal of test summaries that demonstrate attached payload CCSDS secondary header data transmission with the PRCU, STEP, or equivalent and inspection against the SSP 52050 formats and receives the CCSDS secondary header. c) JSC review, inspection and acceptance of AP test summaries to assure attached payload CCSDS secondary header data transmission with the PRCU, STEP, or equivalent and inspection against the SSP 52050 formats and received the CCSDS secondary header.			
93	IRD SSP 57003	3.2.2.1.2 4.3.2.2.1.2	A	Consultative Committee for Space Data Systems Data Fields	The AP CCSDS data field shall contain the AP data from the transmitting data application to the receiving application and the CCSDS checksum in accordance with SSP 52050 , para 3.1.	a) Development and submittal of test summaries that demonstrate attached payload CCSDS data field transmission in accordance with SSP 52050 (para. 3.1, para. 3.1.3.2) formats and when the PRCU, STEP, or	T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						equivalent correctly receives the Attached Payload CCSDS data field.			
					Verification of the AP CCSDS data field shall be by test. The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 formats. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the AP CCSDS data field.	b) JSC review, inspection and acceptance of attached payload to assure CCSDS data field transmission in accordance with SSP 52050 formats and when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data field.			
94	IRD SSP 57003	3.3.2.2.1 4.3.3.2.2.1	A	Consultative Committee for Space Data Systems Unsegmented packets	The AP shall use the CCSDS Unsegmented time code (CUC) in the secondary header as specified in CCSDS 301.0-B-2, CCSDS time code format, para. 2.2. Verification of the Attached Payload CCSDS unsegmented time shall be by test.	a) Development and submittal of test results that demonstrate attached payload CCSDS unsegmented time is in accordance with SSP 52050 formats and with the PRCU, STEP or equivalent for correct CCSDS unsegmented time at the UMA as specified in CCSDS 301.0-B-2, CCSDS time code format, para. 2.2	T	CofC	
					The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 formats. Verification shall be to test with the PRCU, STEP or equivalent, for correct test CCSDS unsegmented time at the UMA.	b) JSC review, inspection and acceptance of attached payload to assure test results verify CCSDS unsegmented time is in accordance with SSP 52050 formats, PRCU, STEP or equivalent for correct time at the UMA.			
95	IRD SSP 57003	3.3.2.3 4.3.3.2.3	A	MIL-STD-1553 Low Data Rate	A. The AP shall implement a single MIL-STD-1553 RT to the payload unique MIL-std-1553 bus. Verification of the Attached Payload MIL-STD-1553 LRDL shall be by inspection. Inspection shall be considered successful when it is shown that there is a single MIL-STD-1553 Remote Terminal to the payload unique MIL-STD-1553 bus.	a) Development and submittal of AP inspection summary that demonstrates a single MIL-STD-1553 Remote Terminal to the payload unique MIL-STD-1553 bus.	I, I&T	CofC	
					B. AP MIL-STD-1553 RT bus addresses shall be in accordance with SSP 50193, book 1, Architecture Interface. Verification of the Attached Payload MIL-STD-1553 LRDL bus address shall be by inspection and test. Inspection shall be considered successful when it is shown that the MIL-STD-1553 Low Rate Data Link (LRDL) in the unique Attached Payload software ICD conforms with SSP 50193. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives	b) Submittal of AP inspection and test summary that demonstrates MIL-STD-1553 LRDL conforms with SSP 50193 with SSP 50193, book 1, Architecture Interface and when the PRCU, STEP, or equivalent correctly receives AP data over the MIL-STD-1553 LRDL. c) JSC review, inspection and acceptance of AP inspections and test summaries to assure single MIL-STD-1553 Remote Terminal to the payload unique MIL-STD-1553 bus, MIL-			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					the AP data over the MIL-STD-1553 LRDL	STD-1553 conformance with SSP 50193, and PRCU/STEP /equivalent receives data over the MIL-STD-1553 LRDL.			
96	IRD SSP 57003	3.3.2.3.1 4.3.3.2.3.1	A	MIL-STD-1553 Protocol	AP bus interface shall use MIL-STD-1553B for electrical characteristics and protocol. Verification shall be by inspection and test. Inspection shall be considered successful when it is shown that the MIL-STD-1553 protocol conforms with SSP 52050. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload data over the MIL-STD-1553.	a) Development and submittal of inspection and test summaries that demonstrate AP conforms with the MIL-STD-1553 protocol of SSP 52050 and when the PRCU, STEP, or equivalent correctly receives data over the MIL-STD-1553.	I&T	CofC	
						b) JSC review, inspection and acceptance of AP inspection and test summaries to assure conformance with SSP 52050 and when the PRCU, STEP, or equivalent correctly receives data over the MIL-STD-1553.			
97	IRD SSP 57003	3.3.2.3.1.1 4.3.3.2.3.1.1	A	Standard Messages	A. The AP shall develop standard messages for the Payload MIL-STD-1553 in accordance with SSP 52050, para. 3.2.3.3. Verification of the Attached Payload standard messages shall be by inspection and test. The inspection shall consist of a review of the CCSDS data packets against paragraph 3.1.3, CCSDS Formats, of SSP 52050.	a1) Development and submittal of inspection summaries that demonstrate AP standard messages conform with CCSDS data packets SSP 52050, para 3.1.3 ( CCSDS Formats), . a2) Development and submittal of test summaries that demonstrate AP data transmission are received by the PRCU, STEP, or equivalent in accordance with SSP 52050 format. a3) List of standard messages as per SSP 52050, para. 3.2.3.3	I&T	CofC	
					The test shall consist of a data transmission with the PRCU, STEP, or equivalent and inspection of the transmitted data against the SSP 52050 format. Inspection shall be considered successful when it is shown that the CCSDS data packets in the unique Attached Payload software ICD conforms with paragraph 3.1.3 CCSDS Formats, of SSP 52050. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data packets.				
					B. MIL-STD-1553 subaddress assignment for standard messages shall be per SSP 52050,	b1) Development and submittal of inspection summaries that demonstrate			

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					Table 3.2.3.2.1.4-1. Verification of the Attached Payload subaddress assignments for standard messages shall be by inspection and test.	AP subaddress assignments for standard messages in conformance with CCSDS data packets with SSP 52050 Table 3.2.3.2.1.4-1. b2) Development and submittal of test summaries that demonstrate PRCU, STEP or equivalent correctly receives the CCSDS data packets.			
					Inspection shall be considered successful when it is shown that the CCSDS data packets in the unique Attached Payload software ICD conforms with Table 3.2.3.2.1.4-1 of SSP 52050. Tests shall be considered successful when the PRCU, STEP or equivalent correctly receives the AP CCSDS data packets.	c) JSC review, inspection and acceptance of AP standard messages to verify conformance with subaddress assignments, CCSDS requirements in accordance with SSP 52050 Table 3.2.3.2.1.4-1/para.3.1.3, and PRCU/STEP correctly receives CCSDS data packets.			
98	IRD SSP 57003	3.3.2.3.1.2 4.3.3.2.3.1.2	A	Commanding	A. The AP shall receive and process commands from the payload MDM that originate from the ground, timeline, payload MDM and PCS inn accordance with SSP 52050, para 3.2.3.4. Verification of AP commanding shall be by inspection and test.	a1) Development and submittal of inspection summaries that demonstrate attached payload software ICD conforms with SSP 52050 (Table 3.2.3.2.1.4-1, para 3.2.3.4) and SSP 57002. a2) Development and submittal of test summaries that demonstrate software ICD conforms with SSP 52050 and SSP 57002.	I&T	Data Cert	
					Inspection shall be considered successful when it is shown that the command in the unique AP software ICD conforms with SSP 52050 and SSP 57002. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload commanding.	b1) Development and submittal of inspection summaries that demonstrate sub address assignments conforms SSP 52050, Table 3.2.3.2.1.4-1			
					B. MIL-STD-1553 sub address assignments for commands shall be per SSP 52050 Table 3.2.3.2.1.4. Verification of the Attached Payload sub address assignments for commands shall be by inspection and test.	b2) Development and submittal of test summaries that demonstrate the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data packets. c) JSC review, inspection and acceptance of attached payload inspection and test summaries that demonstrate sub address conformance with SSP 52050, SSP 57002, and PRCU/STEP correctly receives CCSDS data packets.			
					Inspection shall be considered successful when it is shown that the CCSDS data packets in the				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					unique AP software ICD conforms with Table 3.2.3.2.1.4-1 of SSP 52050. Tests shall be considered successful when the PRCU, STEP, or equivalent correctly receives the Attached Payload CCSDS data packets.				
99	IRD SSP 57003	3.3.2.3.1.3 4.3.3.2.3.1.3	A	Heath and Status Data	A. The AP shall develop heath and status data in accordance with SSP 52050, para. 3.2.3.5. Verification of the Attached Payload health and status data shall be by analysis. The analysis shall be considered successful when it shows that the requirements of SSP 52050 have been met. B. The heath and status data field format shall be developed in accordance with the data field format defined in SSP 57004, Table A-5. Verification of the AP health and status data field format shall be by inspection. The inspection shall be considered successful when it shows the format is developed in accordance with SSP 57002.	a) Development, and submittal of analysis summary that demonstrate AP health and status data shows that the requirements of SSP 52050, para. 3.2.3.5 have been met. b) Development, and submittal of inspection summary that demonstrates AP Verification health/status data field format when it shows the format is developed in accordance with SSP 57002 and SSP 57004 Table A-5.	A,I&T	CofC	
					C. The AP shall respond to the payload MDM polls to heath status with updated data at a predefined rate of 1Hz or 0.1Hz. Verification of the Attached Payload health and status data response to the payload MDM shall be by test. The test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the health and status data from the AP.	c) Development, and submittal of test summaries that demonstrate AP health and status data response when the PRCU, STEP, or equivalent correctly receives the health and status data from the payload MDM polls at a rate of 1.0 Hz or 0.1 Hz. d) JSC review, inspection and acceptance of AP analysis, test, and inspection summaries to assure heath and status data is in compliance with SSP 57002, SSP 52050 and receives data to AP MDMs.			
100	IRD SSP 57003	3.3.2.3.1.4- 4.3.3.2.3.1.4	A	Safety Data	A. Safety Data shall be included in the heath and status data CCSDS packets provided by the attached payload RTs. Verification of the Attached Payload safety data shall be by test. The test shall consist of a transmission of a Health and Status CCSDS data packets and an inspection of the received data for inclusion of safety data. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receive the safety data from the AP.	a) Development, and submittal of test and inspection summary that demonstrates AP PRCU/STEP transmittal of safety data from the Health and Status CCSDS data packets in AP payload safety data	T	CofC	
					B. The AP shall provide as safety data, the standard caution and warning status in accordance with SSP 52050, para. 3.2.3.5, and	b) Development, and submittal of test and inspection summaries that demonstrate AP transmission of a Class			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					identify the safety data in SSP 57002, Table A-1. Verification of the Attached Payload safety data shall be by test.	2/3/4 Caution and Warning message is received data in accordance with SSP 52050, para. 3.2.3.5 and SSP 57002 (Tables A-1/A-5) in SDP.			
					The test shall consist of a transmission of a Class 2, Class 3, and Class 4 Caution and Warning message and an inspection of the received data against the format of paragraph 3.2.3.5, Health and Status Data, of SSP 52050 and Table A-1, Telemetry Parameter Definition, and Table A-5, Health and Status ISS Processed Data Packets, of SSP 57002. Test shall be considered successful when the PRCU, STEP, or equivalent correctly receives the safety data from the AP	c) JSC review, inspection and acceptance of attached payload test and inspection summaries to assure PRCU/STEP transmittal of safety data from the Health and Status CCSDS data packets, and transmission of a Class 2/3/4 Caution and Warning message in accordance with SSP 52050, para. 3.2.3.5 and SSP 57002 (Tables A-1/A-5)			
101	IRD SSP 57003	3.3.2.3.1.4.1. 2 4.3.3.2.3.1.4. 1.2	A	Class 2 Warning	APs shall format C&W word in accordance with SSP 52050, para. 3.2.3.5, as a warning when the attached payload sensors detect a precursor event and event that results in loss of hazard control (Note: Warnings require immediate action). A. Verification that the Attached Payload formats the C&W word for the listed warning event that could manifest to an emergency condition and automatic safing has safed the event shall be by analysis and test.	a1) Development, and submittal of analysis and test summaries to identify AP C&W events and automatic safing/monitoring in appropriate hazard reports and STEP/PRCU health and status is formatted as a warning in accordance with SSP 52050, par 3.2.3.5.. a2) Identification and notification of precursor events that could manifest into an emergency when automatic safing has failed, and the system is not automatically safed	A&T	CofC	
					Analysis of the payload safety hazard reports and payload safety review data shall identify the types of events identified as warnings that are being monitored. The test shall use the STEP, PRCU or equivalent to determine whether or not the C&W word in the Attached Payload's health and status is formatted as a warning for the events identified as warnings. Verification shall be considered successful when the analysis shows the C&W word is formatted in accordance with paragraph 3.2.3.5, Health and Status Data, of SSP 52050 as a warning for events that are defined as a warning.	b1) Identification and notification of an event that results in loss of hazard control such that automatic safing has failed to safe the event and the system is not automatically safed			
					B. Verification that the Attached Payload formats the C&W word for the listed warning events that results in the loss of a hazard control and automatic safing has safed the event shall be by analysis and test. Analysis of the payload	b2) Development, and submittal of analysis and test summaries to identify AP C&W events that results in the loss of a hazard control and automatic safing/monitoring in appropriate hazard			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					safety hazard reports and payload safety review data shall identify the types of events identified as warnings that are being monitored.	reports and STEP/PRCU health and status is formatted as a warning in accordance with SSP 52050, par 3.2.3.5..			
					The test shall use the STEP, PRCU or equivalent to determine whether or not the C&W word in the Attached Payload's health and status is formatted as a warning for the events identified as warnings. Verification shall be considered successful when the analysis shows the C&W word is formatted in accordance with paragraph 3.2.3.5, Health and Status Data, of SSP 52050 as a warning for events that are defined as a warning.	c) JSC review, inspection and acceptance of AP C&W events and monitoring capabilities are included in safety hazard reports and assures use the STEP/PRCU to transmits health and status formatted as a warning for the events identified as warnings in accordance with SSP 52050 para 3.2.3.5.			
102	IRD SSP 57003	3.3.2.3.1.4.1.3 4.3.3.2.3.1.4.1.3	A	Class 3 - Caution	APs shall format the C&W word in accordance with SSP 52050, para. 3.2.3.5, as a caution when the attached payload sensors detect a precursor event or event that results in loss of hazard control and automatic safing has safed the event	a) Development, and submittal of analysis and test summaries to identify AP C&W events as cautions that results in automatic safing/monitoring in appropriate hazard reports and STEP/PRCU health and status is formatted as a warning in accordance with SSP 52050, par 3.2.3.5.	A&T	CofC	
					A. Verification that the Attached Payload formats the C&W word for the listed caution events that could manifest to an emergency condition and automatic safing has safed the event shall be by analysis and test. Analysis of the payload safety hazard reports and payload safety review data shall identify the types of events identified as cautions that are being monitored.				
					The test shall use the STEP, PRCU or equivalent to determine whether or not the C&W word in the Attached Payload's health and status is formatted as a caution for the events identified as cautions. Verification shall be considered successful when the analysis shows the C&W word is formatted in accordance with paragraph 3.2.3.5, Health and Status Data, of SSP 52050 as a caution for events that are defined as a caution.	b) Development, and submittal of analysis and test summaries to identify AP C&W cautions that result in automatic safing/monitoring in appropriate hazard reports and STEP/PRCU health and status is formatted as a warning in accordance with SSP 52050, par 3.2.3.5.			
					B. Verification that the Attached Payload formats the C&W word for the listed caution events that results in the loss of a hazard control and automatic safing has safed the event shall be by analysis and test. Analysis of the payload	c) JSC review, inspection and acceptance of AP C&W events and monitoring capabilities are included in safety hazard reports and assures use the STEP/PRCU to transmits health			

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					safety hazard reports and payload safety review data shall identify the types of events identified as cautions that are being monitored.	and status formatted as a caution for the events identified as warnings in accordance with SSP 52050 para 3.2.3.5.			
					The test shall use the STEP, PRCU, or equivalent to determine whether or not the C&W word in the Attached Payload's health and status is formatted as a caution for the events identified as cautions. Verification shall be considered successful when the analysis shows the C&W word is formatted in accordance with paragraph 3.2.3.5, Health and Status Data, of SSP 52050 as a caution for events that are defined as a caution.				
103	IRD SSP 57003	3.3.2.3.1.4.1. 4 4.3.3.2.3.1.4. 1.4	A	Class 4 - Advisory	APs that require an advisory shall format the C&W word in accordance with SSP 52050, para 3.2.3.5, as an advisory. A. Verification that Attached Payloads requiring advisories format the C&W word for the listed advisory events that are set primarily for ground monitoring purposes shall be by analysis and test.	a) Development, and submittal of analysis and test summaries to identify AP C&W advisories in appropriate hazard reports and STEP/PRCU health and status is formatted as a warning in accordance with SSP 52050, par 3.2.3.5.	A&T	CofC	
					Analysis of proposed payload advisories shall identify the types of events identified as advisories. The test shall use the STEP, PRCU or equivalent to determine whether or not the C&W word in the Attached Payload's health and status is formatted as an advisory for the events identified as advisories.				
					Verification shall be considered successful when the analysis show the C&W word is formatted in accordance with paragraph 3.2.3.5, Health and Status Data, of SSP 52050 as an advisory for events that are defined as an advisory.	b) Development, and submittal of analysis and test summaries to identify AP C&W advisories in appropriate hazard reports and STEP/PRCU health and status is formatted as a advisory and time tagged for failure isolation, trending, and sustaining engineering. ect. in accordance with SSP 52050, par 3.2.3.5. c) JSC review, inspection and acceptance of AP C&W events and monitoring capabilities are included in safety hazard reports and assures use the STEP/PRCU to transmits health and status formatted as an advisory for the events identified as advisories in accordance with SSP 52050 para 3.2.3.5.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Verification that Attached Payloads requiring advisories format the C&W word for the listed advisory events that are a data item that most likely will not exist permanently in the telemetry list but should be time tagged and logged for failure isolation, trending, sustaining engineering, etc. shall be by analysis and test. Analysis of proposed payload advisories shall identify the types of events identified as advisories.				
					The test shall use the STEP, PRCU or equivalent to determine whether or not the C&W word in the Attached Payload's health and status is formatted as an advisory for the events identified as advisories. Verification shall be considered successful when the analysis show the C&W word is formatted in accordance with paragraph 3.2.3.5, Health and Status Data, of SSP 52050 as an advisory for events that are defined as an advisory.				
104	IRD SSP 57003	3.3.2.3.1.5 4.3.3.2.3.1.5	A	Service Requests	The AP shall develop service requests in accordance with SSP 52050, para 3.2.3.7 in format in accordance with SSP 52050, table 3.2.3.7-1. Verification of the APservice requests shall be by inspection and test. Inspection shall be considered successful when it is shown that the service requests in the unique AP software ICD conforms with SSP 52050 and SSP 57002. Verification shall be to test with the PRCU, for correct test service requests at the UMA.	a) Development and submittal of inspection and test summaries that demonstrate AP service requests to show conformance with SSP 52050 (3.2.3.7 and table 3.2.3.7-1) and SSP 57002 and PRCU test service at the UMA. b) JSC review, inspection and acceptance of AP inspection and test summaries to assure service requests are in conformance with SSP 52050 and SSP 57002.	I&T	CofC	
105	IRD SSP 57003	3.3.2.3.1.6 4.3.3.2.3.1.6	A	Ancillary Data	APs which require ancillary data to be provided by the MDM shall be capable of receiving those parameters via Broadcast Ancillary Data Sets or Via unique Ancillary Data sets as described in SSP 52050, para. 3.2.3.8. Verification of the AP ancillary data shall be by inspection and test. Inspection shall be considered successful when it is shown that the ancillary data in the unique AP software ICD conforms with SSP 52050 and SSP 57002. Verification shall be to test with the PRCU, for correct test ancillary data at the UMA.	a) Development and submittal of inspection and test summaries to demonstrate AP ancillary data conforms with SSP 52050 (part 3.2.3.8) and SSP 57002 (Appendix B) and PRCU for correct test ancillary data at the UMA. b) JSC review, inspection and acceptance of inspection and test summaries to assure AP ancillary data conforms with SSP 52050 and SSP 57002 and PRCU for correct test ancillary data at the UMA.	I&T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
106	IRD SSP 57003	3.3.2.3.1.7 4.3.3.2.3.1.7	A	File Transfer	The AP requiring file transfers shall perform file transfers in accordance with SSP 52050, Verification of the Attached Payload file transfer shall be by inspection and test. Inspection shall be considered successful when it is shown that the file transfer in the unique Attached Payload software ICD conforms with SSP 52050 and SSP 57002. Verification shall be to test with the PRCU, for correct test file transfer at the UMA.	a) Development and submittal of test and inspection summaries that demonstrate AP file transfer conforms with SSP 52050 (para. 3.2.3.9.), SSP 57002, and test of PRCU for correct test file transfer at the UMA.	I&T	CofC	
						b) JSC review, inspection and acceptance of test and inspection summaries that demonstrate AP file transfer conforms with SSP 52050, SSP 57002, and test of PRCU for correct test file transfer at the UMA.			
107	IRD SSP 57003	3.3.2.3.1.8 4.3.3.2.3.1.8	A	Low Rate Telemetry	The AP requiring low rate telemetry shall develop low rate telemetry in accordance with SSP 52050, para. 3.2.3.10. Verification of the AP low rate telemetry shall be by inspection and test. Inspection shall be considered successful when it is shown that the low rate telemetry in the unique AP software ICD conforms with SSP 52050 and SSP 57002. Verification shall be to test with the PRCU, for correct low rate telemetry at the UMA.	a) Development and submittal of test and inspection summaries that demonstrate AP low rate telemetry conforms with SSP 52050 ( para.3.2.3.10) and SSP 57002 with testing of PRCU to verify correct low rate telemetry at the UMA. b) JSC review, inspection and acceptance of AP test and inspection summaries to assure AP low rate telemetry conforms with SSP 52050 and SSP 57002 with testing of PRCU to verify correct low rate telemetry at the UMA.	I&T	CofC	
108	IRD SSP 57003	3.3.2.3.1.10 4.3.3.2.3.1.10	A	Implemented Mode Codes	The attached payload shall implement MIL-STD-1553 mode codes in accordance with SSP 52050, para 3.2.3.2.1.5 and Table 3.2.3.2.1.5-1. Verification of the Attached Payload implemented mode codes shall be by inspection and test.	a) Development and submittal of inspection and test summaries that demonstrate attached payload implemented mode codes conforms with SSP 52050 and SSP 57002 and the PRCU correctly receives the implemented mode codes from the AP.	I&T	CofC	
					Inspection shall be considered successful when it is shown that the implemented mode codes in the unique Attached Payload software ICD conforms with SSP 52050 and SSP 57002.	a2) Delivery of MIL-STD-1553 mode codes in accordance with SSP 52050, para 3.3.2.3.1.5 and Table 3.2.3.2.1.5-1.			
					Inspection shall be considered successful when it is shown that the implemented mode codes in the unique Attached Payload software ICD conforms with SSP 52050 and SSP 57002. Test shall be considered successful when the	b) JSC review, inspection and acceptance of AP inspection and test summaries to assure implemented mode codes conform with SSP 52050 and SSP 57002 and the PRCU correctly			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					PRCU correctly receives the implemented mode codes from the Attached Payload.	receives the implemented mode codes.			
109	IRD SSP 57003	3.3.2.3.1.11 4.3.3.2.3.1.1 1	A	Illegal Commands	If an illegal command occurs from MIL-STD-1553, the AP shall be respond to such illegal commands by setting a message error bit in the RT status word.	a) Development, and submittal of test summaries that demonstrate AP with the PRCU for correct test of the MIL-STD-1553 illegal commands produced by setting the message error bit in the status word response at the UMA.	T	CofC	
					Verification of the Attached Payload illegal commands shall be by test. Verification shall be to test with the PRCU, for correct test of the MIL-STD-1553 illegal commands produced by setting the message error bit in the status word response at the UMA.	b) JSC review, inspection and acceptance of AP test summaries to assure PRCU of the MIL-STD-1553 illegal commands produced by setting the message error bit in the status word response at the UMA.			
110	IRD SSP 57003	3.3.2.3.2.1 4.3.3.2.3.2.1	A	LRDL Connector Pin Assignments	The AP that interfaces with MIL-STD-1553 bus to transmit data and/or receive commands shall utilize the connector and pins assignments for the UMA in accordance with SSP 57004, para 3.2.1. Verification of the Attached Payload MIL-STD-1553 bus A connector and pin assignment shall be by inspection and test.	a) Development and submittal of inspection summaries that demonstrate UMA MIL-STD-1553 conformance with SSP 57004, para. 3.2.1 and UMA HRDL connector to mate with a test connector SSQ 21635, NATC07T15N4SN a2) Development and submittal of test summaries that demonstrate AP with the PRCU for correct test of the MIL-STD-1553 to receive and execute commands at the UMA with various address assignments.	I&T	CofC	
					Verification shall be by inspection of the UMA MIL-STD-1553 to the unique Attached Payload hardware ICD against SSP 57004. Verification shall be to test with the PRCU, for correct test of the MIL-STD-1553 to receive and execute commands at the UMA with various address assignments. Verification shall be by inspection of the UMA HRDL connector to mate with a test connector SSQ 21635, NATC07T15N4SN.	b) JSC review, inspection and acceptance of AP inspection and test summaries to assure UMA MIL-STD-1553 conformance with SSP 57004, UMA HRDL connector to mate with a test connector SSQ 21635, NATC07T15N4SN, and AP with PRCU for correct test of the MIL-STD-1553 to receive and execute commands at the UMA with various address assignments.			
111	IRD SSP 57003	3.3.2.3.2.2 4.3.3.2.3.2.2	A	LRDL Signal Characteristics	A. The AP which requires connectivity to the payload MIL-STD-1553 bus shall meet the electrical characteristics in accordance with MIL-STD-1553. Verification of the Attached Payload as it connects to MIL-STD-1553 bus A and bus B shall be by test. Verification shall be to test with the PRCU, for correct test of the MIL-STD-1553 signal characteristics at the	a) Development, and submittal of test summaries that demonstrate AP as it connects to the PRCU and MIL-STD-1553 bus A and bus B with the PRCU to assure conformance with MIL-STD-1553 signal characteristics at the UMA with a MIL-STD-1553 bus analyzer as specified in MIL-HBK-	I&T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					UMA with a MIL-STD-1553 bus analyzer as specified in MIL-HBK-1553 Handbook.	1553 Handbook, para. 4.5.2.			
					B. The AP MIL-STD-1553 bus shall meet the terminal characteristics in accordance with MIL STD-1553, para. 4.5.2 Verification of the Attached Payload MIL-STD-1553 bus A and bus B shall be by test. Verification shall be to test with the PRCU, for correct test of the MIL-STD-1553 signal characteristics at the UMA with a MIL-STD-1553 bus analyzer as specified in MIL-HBK-1553 Handbook.	b) JSC review, inspection and acceptance of test summaries that demonstrate AP as it connects to the PRCU and MIL-STD-1553 bus A and bus B to assure conformance with MIL-STD-1553 signal characteristics at the UMA with a MIL-STD-1553 bus analyzer as specified in MIL-HBK-1553 Handbook.			
112	IRD SSP 57003	3.3.2.3.2.3 4.3.3.2.3.2.3	A	LRDL Cabling	A. The AP MIL-STD-1553 bus internal wiring characteristics of 75 Ohm or equivalent shall be in accordance with SSQ 21655 Verification shall be by inspection of the UMA LRDL cable. Verification shall be considered successful when it is shown that the UMA LRDL cable meets SSQ 21655 or NASA approved equivalent.	a) Development, and submittal of inspection summary to demonstrate AP UMA LRDL cable meets SSQ 21655 or NASA approved equivalent and when the cable drawings are shown to require that the LRDL cables) cannot exceed 10 feet (30.7 meters).	I	CofC	
					B. The AP MIL-STD-1553 bus internal wiring stub length shall not exceed 10 feet when measured from the UMA active half connector to the AP/UCC MIL-STD-1553 RTVerification shall be by inspection of the UMA LRDL cable. Verification shall be considered successful when the cable drawings are shown to require that the LRDL cables cannot exceed 10' (30.7 m).	b) JSC review, inspection and acceptance of AP inspection summary to assure AP UMA LRDL cable meets SSQ 21655 or NASA approved equivalent and when the cable drawings are shown to require that the LRDL cables) cannot exceed 10 feet (30.7 meters).			
113	IRD SSP 57003	3.3.2.4.1 4.3.3.2.4.1	A	Payload to high Rate Frame Multiplexer Protocols	The AP shall use the HRFM common protocols in accordance with SSP 50184, para. 3.2.2. Verification of the AP HRFM Protocols shall be by inspection and test. Inspection shall be considered successful when it is shown that the AP complies with SSP 50184. Tests shall be considered successful when the AP correctly communicates with the payload MDM.	a) Submittal of test and inspection summaries that demonstrate AP HRFM complies with SSP 50184, para. 3.2.2 and correctly communicates with the payload MDM. b) JSC review, inspection and acceptance of AP test and inspection summaries to assure HRFM complies with SSP 50184 and correctly communicates with the payload MDM.	I&T	CofC	
114	IRD SSP 57003	3.3.4.2.4.1 4.3.3.4.2.4.1	A	HRDL Physical Signals	Physical signaling of the HRDL shall be in accordance with SSP 50184, para. 3.0. Verification of the AP HRDL physical signaling shall be by test and analysis. Verification of the fiber optic transmitted waveform at the fiber optic transmitter component of the Attached Payload shall be by test at the UMA.	a1) Development and submittal of test summaries that demonstrate AP HRDL physical signaling of fiber optic transmitted waveform (at the fiber optic transmitter component at the UMA), fiber optic receiver fiber optic sensitivity and bus error rate (BER) per the ANSI X3.255.1996 test, and fiber	A&T	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						optic receiver component of the UMA.			
					b1) Crew or ground monitoring available to assure that inhibits are inserted prior to connector manipulation) JSC PSRP review, inspection and acceptance of attached payload analysis that demonstrates attached payload equipment connected to Interface C meets the loss of power safety requirements specified in NSTS 1700.7 ISS Addendum	a2) Development and submittal of analysis that demonstrate AP Payload HRDL physical signaling MA fiber optic receiver sensitivity and BER. in accordance with SSP 50184, para. 3.0 b) JSC review, inspection and acceptance of AP test and analyses summaries to assure fiber optic signaling and BER at the UMA.			
115	IRD SSP 57003	3.3.2.4.2.2 4.3.3.2.4.2.2	A	Encoding	The attached payload using the HRDL shall encode data in accordance with SSP 50184, paras. 3.13 and 3.1.3.1 and Tables 3.1.3.1-1 and 3.1.3.2.	a1) Development and submittal of inspection summaries that demonstrate AP HRDL encoding by inspection of the UMA HRDL protocol at the UMA against SSP 50184, paras. 3.13 and 3.1.3.1 and Tables 3.1.3.1-1 and 3.1.3.2.	I&T	CofC	
					Verification of the Attached Payload HRDL encoding shall be by inspection and test. Verification shall be by inspection of the UMA HRDL protocol to the unique Attached Payload hardware at the UMA against SSP 50184. Verification shall be to test the UMA with the PRCU, for correct test of the HRDL protocol.	a2) Development and submittal of test summaries that demonstrate AP HRDL encoding at the UMA with the PRCU for correct test of the HRDL protocol. b) JSC review, inspection and acceptance of AP inspection and test summaries that demonstrate AP HRDL encoding per SSP 50184.			
116	IRD SSP 57003	3.3.2.4.2.3 4.3.3.2.4.2.3	A	Symbols used in Testing	The AP using the HRDL shall provide a Halt symbol (h) for use in optical power tests in accordance with SSP 50184, Tables 3.1.3.1-1. Verification shall be by test in accordance with 4.3.3.2.4.3.1, HRDL transmitted optical powers at the UMA.	a) Development, and submittal of AP test summaries that demonstrate HRDL transmitted optical powers at the UMA in accordance with in accordance with SSP 50184, Tables 3.1.3.1-1 and IRD SSP 57003 4.3.3.2.4.3.1. b) JSC review, inspection and acceptance AP test summaries to assure HRDL transmitted optical powers at the UMA in accordance with 4.3.3.2.4.3.1.	T	CofC	
117	IRD SSP 57003	3.3.4.2.3.1 4.3.3.4.2.3.1	A	HRDL Transmitted Optical Power	a) The attached payload designed to provide HRDL services shall transmit a signal in accordance with SSP 50184 at a minimum optical power of -16.33 dBm, as measured at the UMA interface in a stressed environment and a minimum average optical power of -15.60 dBm as measured at the UMA interface in an unstressed environment.	a1) Development and submittal of test summary (with fiber optic power meter per ANSI X3.255-1996) that demonstrates AP correct optical power at the UMA using the Halt symbol. in accordance with SSP 50184 at a minimum optical power of -16.33 dBm, (stressed environment at the UMA interface) a2) Design review, acceptance testing,	T	CofC	May need to clarify the definition of stressed and unstressed environment.

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						and inspection to verify minimum average optical power of -15.60 dBm (unstressed environment at the UMA interface)			
					b) The transmitted optical power shall be less than -9.0dBm. Verification shall be to test with fiber optic power meter per ANSI X3.255–1996, for correct optical power at the UMA using the Halt symbol. The optical power perturbations from the test setup are not included in the stated power requirement. The perturbations from the test are to be documented.	a3) Design review, acceptance testing, and inspection to verify transmitted optical power is less than -9.0dBm b) JSC review, inspection and acceptance of AP test summary to assure correct optical power at the UMA.			
					This test shall be considered successful when the requirement is met or exceeded after the test setup variations are removed from the result.				
118	IRD SSP 57003	3.3.2.4.3.2 4.3.3.2.4.3.2	A	HRDL Received Optical Power	a) The attached payload designed to provide HRDL services shall receive a HRDL signal in accordance with SSP 50184 at a minimum optical power of -30.86 dBm, as measured for the UMA interface in a stressed environment and minimum optical power of -31.60 dBm as measured for the UMA interface in an unstressed environment	a1) Development, and submittal of test summary to demonstrate AP (at the UMA) with a calibrated fiber optic source using the Halt symbol at the minimum power. . a2) Design review, acceptance testing, and inspection to verify attached payload receive HRDL signals in accordance with SSP 50184 a.3) Minimum optical power of -16.33 dBm, (stressed environment at the UMA interface)	T	CofC	
					b) The received optical power shall be less than -9.0 dBm.. Verification shall be to test at the UMA with a calibrated fiber optic source using the Halt symbol at the minimum power. The optical power perturbations from the test setup are not included in the stated power requirement. The perturbations from the test are to be documented. This test shall be considered successful when the requirement is met or exceeded after the test setup variations are removed from the result.	a.4) Minimum average optical power of -15.60 dBm (unstressed environment at the UMA interface) a3)Design review, acceptance testing, and inspection to verify optical power is less than -9.0dBm b) JSC review, inspection and acceptance of test summary to demonstrate AP (at the UMA) with a calibrated fiber optic source using the Halt symbol at the minimum power.			
119	IRD SSP 57003	3.3.2.4.4 4.3.3.2.4.4	A	HRDL Optical Cable	The AP shall use fiber optic cable in accordance with SSQ 21654. Verification shall be by inspection of the Attached Payload to UMA HRDL cable. Verification shall be considered successful when it is shown that the Attached Payload to	a) Development and submittal of inspection summary that demonstrate AP to UMA HRDL cable meets SSQ 21654 or NASA Attached Payload approved equivalent. b) JSC review, inspection and	I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					UMA HRDL cable meets SSQ 21654 or NASA Attached Payload approved equivalent.	acceptance of inspection summary that demonstrate AP to UMA HRDL cable meets SSQ 21654 or NASA Attached Payload approved equivalent.			
120	IRD SSP 57003	3.3.2.4.5 4.3.3.2.4.5	A	HRDL Fiber Optical Cable Bend Radius	The attached payload shall develop the routing, installation, and handling procedures to assure the minimum bend radius of 2 inches or greater is maintained at all times for the fiber optic cable.	a1) Development, and submittal of inspection summary that demonstrate AP to UMA HRDL cable routing, installation and handling procedures do not cause the cable to be bent in a tighter radius to verify that fiber optic bend radius is greater than 2 inches a2) Complete approved fiber optic cable handling and installation procedures	I	CofC	
					Verification shall be by inspection of the Attached Payload to UMA HRDL cable routing, installation and handling procedures. Verification shall be considered successful when the inspection shows that the routing, installation and handling procedures do not cause the cable to be bent in a tighter radius.	a3) Trained personnel used for installing fiber optic cables to assure bend radius of 2 inches or greater is maintained. b) JSC review, inspection and acceptance of inspection summary to assure AP to UMA HRDL cable routing, installation and handling procedures do not cause the cable to be bent in a tighter radius.			
121	IRD SSP 57003	3.3.2.4.6 4.3.3.2.4.6	A	HRDL Connectors	The attached payload interfacing to the HRDL shall utilize the UMA passive half connectors as defined in SSQ 21637.	a) Development, and submittal of inspection and demonstration summary of the AP to UMA HRDL connector to mate with a test connector SSQ 21635, NATC07T13N4SN in accordance with 3.3.2.4.6.	I&D	CofC	
					Verification shall be by inspection of the Attached Payload to UMA HRDL connector and demonstration of the Attached Payload UMA HRDL connector to mate with a test connector SSQ 21635, NATC07T13N4SN. Verification shall be considered successful when the inspection and demonstration show compliance with 3.3.2.4.6.	b) JSC review, inspection and acceptance of inspection/demonstration summary to assure AP to UMA HRDL connector to test connector SSQ 21635, NATC07T13N4SN in accordance with 3.3.2.4.6.			
122	IRD SSP 57003	3.3.2.4.7 4.3.3.2.4.7	A	HRDL Connector Pin assignments	The AP that interfaces with the HRDL shall utilize the connector and pins assignments for the UMA in accordance with SSP 57004, para 3.2.1 Verification shall be by inspection of the AP UMA HRDL connector/pin assignments to the unique Attached Payload hardware ICD against	a) Development, and submittal of inspection summary that demonstrate AP UMA HRDL connector/pin assignments in accordance with SSP 57004, para.3.2.1. b) JSC review, inspection and acceptance of AP inspection summary	I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					SSP 57004.	to assure UMA HRDL connector/pin assignments in accordance with SSP 57004, para.3.2.1.			
					Verification shall be considered successful when the inspection shows that the connector and pin assignments in accordance with paragraph 3.2.1 of the unique Attached Payload ICD.				
123	IRD SSP 57003	3.3.2.5 4.3.3.2.5	A	Portable Computer System	AP who desire to utilize the PCS shall interface remotely through the MIL-STD-1553 in accordance with the requirements of SSP 57000, paras. 3.3.8.2/3.3.8.2.1. Verification shall be by analysis. The verification shall be considered successful when the analysis shows that the requirements defined in SSP 57000, paragraph 3.3.8.2 and 3.3.8.2.1 are met.	a) Development, and submittal of analysis summary that demonstrate AP communications through the MIL-STD-1553 are in accordance with the requirements of SSP 57000, paras. 3.3.8.2/3.3.8.2.1. b) JSC review, inspection and acceptance of analysis summary to assure AP meets the requirements defined in SSP 57000, paras. 3.3.8.2 and 3.3.8.2.1 for MIL-STD 1553 interface.	A	CofC	
124	IRD SSP 57003	3.4.1.1 4.3.4.1.1	A	Passive Thermal Control Design Requirements for payloads on the ITS PAS and P3 UCCAS	The attached passive thermal control analysis shall be in accordance with the S3 thermal math model in D684-10058-03-01. Verification shall be by analysis. Verification shall be considered to be successful when the analysis shows that the AP passive thermal control analysis is in accordance with the S3 thermal math model in D684-10058-03-01.	a) Development, and submittal of analysis summary that demonstrates AP passive thermal control is in accordance with the S3 thermal math model in D684-10058-03-01. b) JSC review, inspection and acceptance of AP analysis summary to assure passive thermal control is in accordance with the S3 thermal math model in D684-10058-03-01.	A	CofC	
125	IRD SSP 57003	3.4.1.1.1 4.3.4.1.1.1	A	Temperature Requirement	The AP to the S3 PAS and P3 UCCAS shall meet all requirements specified when the structural interface temperature is within -120 F and 200F.	a1) Development, and submittal of analysis summary that demonstrates AP meets all requirements when the S3 PAS and P3 UCCAS interface temperature is between -120 degrees Fahrenheit (F) and +200 degrees F.	A	CofC	
					The analysis shall show that the AP meets all requirements when the S3 PAS and P3 UCCAS interface temperature is between -120 degrees F and +200 degrees F. Verification shall be considered successful when the analysis shows the requirements have been met.	b) JSC review inspection and acceptance of AP analysis summary to assure all thermal requirements are met when the S3 PAS and P3 UCCAS interface temperature is between -120 degrees Fahrenheit (F) and +200 degrees F.			
126	IRD SSP 57003	3.4.1.1.5 4.3.4.1.1.5	A	Thermal Radiation Models	A) Simplified thermal models of the attached payloads shall be provided to the ISS program	a1) S3 PAS and P3 UCCAS simplified thermal models provided to JSC	A or T, Thermal Model		

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					by the payload developer B1) The attached payload simplified thermal math models shall identify all surfaces over 10% specular	a2) Development and submittal of AP simplified thermal models to the ISS Program that demonstrate AP that simplified thermal models surfaces over 10% specular and that specularity values are provided. b1) Identification of surfaces over 10 % specular reflection			
					B2)Specularity values for those surfaces shall be provided. A. Verification shall be considered complete when the simplified thermal models of the AP are provided to the ISS Program. B3. Verification shall be by analysis. The verification shall be considered successful when analysis shows that the AP simplified thermal models identify all surfaces over 10% specular and that specularity values are provided for those surfaces.	b2) Listing of specular values for all payload surfaces. c) JSC review, inspection and acceptance of AP simplified thermal models to assure models surfaces over 10% specular and that specularity values are provided.			
127	IRD SSP 57003	3.4.1.1.6 4.3.4.1.1.6	A	Thermal Exchange Between Payloads	A. Attached payload radiation surfaces (designed to reject heat) shall be oriented so that they have a cumulative view no greater than 0.1 to any surface of the generic attached payload operational envelop as defined in figure 3.1.3.1.1.1-1 placed on any other S3 or P3 attached site. Verification shall be by analysis.	a1) Development and submittal of analysis summary that demonstrates AP geometry shows no active radiation surfaces have a cumulative view factor greater than 0.1 to any surface of the generic AP operational envelope as defined in Figure 3.1.3.1.1.1-1 placed on any other S3 or P3 attach site or when an integrated analysis determines that active radiation surfaces of the AP do not adversely affect the operation of other APs to demonstrate AP cumulative view is no greater than 0.1 to any surface as defined in Figure 3.1.3.1.1.1.	A	CofC	
					Verification shall be considered successful when analysis of the AP geometry shows that no active radiation surfaces have a cumulative view factor greater than 0.1 to any surface of the generic attached payload operational envelope as defined in Figure 3.1.3.1.1.1-1 placed on any other S3 or P3 attach site or when an integrated analysis determines that active radiation surfaces of the AP do not adversely affect the operation of other AP Payloads.	a2) Design review and drawings to verify orientation of payload radiation surfaces			
					B. AP surfaces with a view of other attached payloads shall have a specularity of 10% or less Verification shall be by analysis or test.	b1) Development and submittal of analysis and test summary that demonstrates AP surface properties			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						shows that surfaces with a view to other APs have a specularity of 10% or less or when an integrated analysis determines that specular surfaces of the APs do not adversely affect the operation of other APS. b2) Identification of surfaces over 10 % specular reflection b3) Listing of specular values for all payload surfaces			
					Verification shall be considered successful when analysis or test of surface properties shows that AP surfaces with a view to other AP have a specularity of 10% or less or when an integrated analysis determines that specular surfaces of the AP do not adversely affect the operation of other APs.	c) JSC review, inspection and acceptance of AP analysis and test summaries to assure AP surface properties and geometry have a specularity of 10% or less or when an integrated analysis determines specular surfaces do not adversely affect the operation of other APS.			
128	IRD SSP 57003	3.5.1.5.1 4.3.5.1.5.1	A	Molecular Column Density from Venting, Leakage, and Outgassing	Contributions to the molecular column density created by an AP along any obstructed line of sight shall not exceed $1 \times 10^{14}$ molecules/cm <sup>2</sup> for any individual species, when viewed from any other attached payload location. An analysis shall be performed using AP design data and operational conditions to determine molecular column densities for individual species.	a) Development and submittal of analysis summary that demonstrates AP design data/operational conditions of molecular column densities produced by the AP do not exceed $1 \times 10^{14}$ molecules/cm <sup>2</sup> for any individual species, when viewed from any other Attached Payload location. The vent axis will be oriented to preclude direct plume impingement on other Attached Payloads.	A	Data Cert	
					Verification shall be considered successful when the analysis shows that the molecular column densities produced by the APs do not exceed $1 \times 10^{14}$ molecules/cm <sup>2</sup> for any individual species, when viewed from any other Attached Payload location. The vent axis will be oriented to preclude direct plume impingement on other Attached Payloads.	b) JSC review, inspection and acceptance of AP analysis summary to assure design data/operational conditions of molecular column densities produced do not exceed $1 \times 10^{14}$ molecules/cm <sup>2</sup> for any individual species and vent axis will be oriented to preclude direct plume impingement on other APs.			
129	IRD SSP 57003	3.5.1.5.2 4.3.5.1.5.2	A	Molecular Deposition from Materials Outgassing and Venting	A. APs and their complement materials exposed to space vacuum (which includes the internal materials within a non-pressurized shell as well as exposed materials) and vents shall not produce a cumulative contaminate deposit of $1 \times 10^{-14}$ gm/cm <sup>2</sup> /sec on other APs using normal operating temperatures of the contamination source materials (emitters) and normal operating temperatures of other APs	a1) Analysis of attached payload materials (exposed to space and venting) to verify that cumulative deposits of $1 \times 10^{-14}$ gm/cm <sup>2</sup> /sec on attached payloads b1) Analysis of attached payload materials (exposed to space and venting) to verify that cumulative deposits of $1 \times 10^{-15}$ gm/cm <sup>2</sup> /sec on	A&T	Data Cert	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					(receivers).	ISS external surfaces) Development and submittal of test and analyses summaries per ASTM E 1559 to demonstrate AP component materials outgassing exposed to space vacuum cumulative contaminant deposits do not exceed 1x10 <sup>-14</sup> gm/cm2/sec on other APs			
					Outgassing testing shall be performed of the AP component materials exposed to space vacuum and one used in quantities greater than 0.1 m2 surface area per guidelines established in ASTM E 1559. The test shall be of long duration (144 hours minimum).				
					The materials samples (emitters) shall be tested at their nominal operating temperature. During the ASTM E 1559 testing, one QCM will be maintained at -40°C; one QCM will be maintained at +25°C; and one QCM will be maintained at a temperature between -40°C and +25°C. Verification shall be considered successful when the AP demonstrates by analysis that cumulative contaminant deposits do not exceed 1x10 <sup>-14</sup> gm/cm2/sec on other APs.	a2) Development and submittal of analysis and test summaries per ASTM E 1559 to demonstrate AP materials exposed to space vacuum with quantities greater than 0.1 m2 surface area that cumulative contaminant deposits do not exceed 1x10 <sup>-15</sup> gm/cm2/sec on ISS element external contamination sensitive surfaces.			
					B. APs and their compliment materials exposed to space vacuum (which includes the internal materials within a non-pressurized shell as well as exposed materials) and vents shall not produce contaminate deposit of 1X10 <sup>-15</sup> gm/cm2/sec on ISS elements using normal operating temperatures of the contamination source materials(emmitters) and normal operating temperatures of ISS external contamination sensitive surfaces (receivers). .	c) JSC review, inspection and acceptance of outgassing test and analyses results to assure that AP materials exposed to space vacuum with quantities greater than 0.1 m2 surface area that cumulative contaminant deposits do not exceed 1x10 <sup>-15</sup> gm/cm2/sec on ISS element external contamination sensitive surfaces.			
					Outgassing testing shall be performed of the AP component materials exposed to space vacuum and are used in quantities greater than 0.1 m2 surface area per guidelines established in ASTM E 1559. The test shall be of long duration (144 hours minimum)				
					The materials samples (emitters) shall be tested at their nominal operating temperature. During the ASTM E 1559 testing, one QCM will be				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					maintained at -40°C; one QCM will be maintained at +25°C; and one QCM will be maintained at a temperature between -40°C and +25°C. Verification shall be considered successful when the AP demonstrates by analysis that cumulative contaminant deposits do not exceed 1x10 <sup>-15</sup> gm/cm <sup>2</sup> /sec on ISS element external contamination sensitive surfaces.				
130	IRD SSP 57003	3.5.1.5.3 4.3.5.1.5.3	A	Particulates	APs shall limit any active venting release of particulates to less than 100 microns in size Verification of limitation of particulate dispersal by active venting shall be by analysis and/or inspection. The analysis and/or inspection of drawings shall verify that gases containing particulates greater than 100 microns are not actively vented from the AP. The verification shall be considered successful when the analysis and/or inspection of drawings show that the AP design does not release particulates greater than 100 microns in size.	a1) Development and submittal of analysis and inspection results to demonstrate AP particulate dispersal by active venting verify that gases containing particulates greater than 100 microns do not release particulates greater than 100 microns in size. b) JSC review, inspection and acceptance of AP analysis and inspection results to assure AP particulate dispersal by active venting verify that gases containing particulates greater than 100 microns do not release particulates greater than 100 microns in size.	A or I	CofC	
131	IRD SSP 57003	3.5.1.8.1 4.3.5.1.8.1	A	APs Contained or Generated Ionizing Radiation	The AP connected to Interface C shall meet EMC requirements of SSP 30243, para. 3.1 and 3.6.2. AP containing or using radioactive materials or that generate ionizing radiation shall comply with NSTS 1700.7 ISS Addendum, para. 212.1.	a) Development, and submittal of analysis that demonstrate AP containing or using radioactive materials or generating ionizing radiation meets the requirements of 1700.7 ISS Addendum, para 212.1.	Safety and HR SVM References	CofC	
					Verification containing or using radioactive materials or generating ionizing radiation meet the requirements of 1700.7 ISS Addendum shall be performed and submitted to the PSRP in accordance with NSTS 13830. Verification shall be considered successful when hazard reports and safety data presented to the PSRP during the phased safety reviews are approved.	b) JSC PSRP approval of AP analysis that demonstrate radioactive materials or generating ionizing radiation meets the requirements of 1700.7 ISS Addendum.			
132	IRD SSP 57003	3.5.1.8.2 4.3.5.1.8.2	A	Ionizing Radiation Dose	APs shall be designed to not provide an unsafe condition or one that could cause damage to external equipment as a result of exposure to a total dose specified in SSP 30512, para. 3.1.2. Verification that equipment and subsystems are designed to not produce an unsafe condition or one that could cause damage to equipment external to the payload as a result of exposure	a1) License requirements for the use of radioactive materials a1) Analysis and testing to verify radiation dose specified in SSP 30512 and a radiation dose design margin of two to be applied. a2) Development and submittal of analysis summary that demonstrates	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					to ionizing radiation shall be by analysis.	AP do not produce an unsafe condition or one that could cause damage to equipment external to the payload as a result of exposure to ionizing radiation as specified in SSP 30512, table 3.1.2.			
					An analysis of equipment and subsystems shall be performed using the operational lifetime and parts characterization data to assure that the design meets the requirement when exposed to ionizing radiation. The verification shall be considered successful when the analysis shows that the AP equipment and subsystems will not produce an unsafe condition or one that could cause damage to equipment external to the payload when exposed as specified in SSP 30512, table 3.1.2.	b1) Description of usage location and quantity of radioactive materials b2) JSC review, inspection and acceptance of AP analysis summary that demonstrates safe equipment external to the payload as a result of exposure to ionizing radiation as specified in SSP 30512, table 3.1.2. c) JSC approval of usage of radioactive materials (Interagency Nuclear Safety Review Panel)			
133	IRD SSP 57003	3.5.1.8.3 4.3.5.1.8.3	A	Nominal Single Event Effects Ionizing Radiation	APs shall be designed to operate in and to not produce an unsafe condition or one that would cause damage to other equipment as a result of exposure to total dose specified in SSP 30512, para. 3.1.2 . Verification that equipment and subsystems are designed to not produce an unsafe condition or one that could cause damage to equipment external to the payload as a result of exposure to SEE ionizing radiation shall be by analysis.	a1) Analysis and testing to verify radiation dose (specified in SSP 30512, par 3.1.2 with margin of two) does not impede operations or creates a hazard to attached payload/other equipment. a2) Development and submittal of analysis summary that demonstrate attached payload equipment and subsystems are designed to not produce an unsafe condition or one that could cause damage to equipment external to the payload as a result of exposure to SEE ionizing radiation when exposed to the specified environment.	A	CofC	
					An analysis of equipment and subsystems shall be performed using the operational lifetime and parts characterization data to assure that the design meets the requirement when exposed to SEE ionizing radiation. The verification shall be considered successful when the analysis shows that the AP equipment and subsystems will not produce an unsafe condition or one that could cause damage to Attached Payload equipment external to the payload when exposed to the specified environment.	b) JSC review, inspection and acceptance of AP analysis summary that demonstrate attached payload equipment and subsystems are designed to not produce an unsafe condition or one that could cause damage to equipment external to the payload as a result of exposure to SEE ionizing radiation when exposed to the specified environment.			
134	IRD SSP 57003	3.5.1.8.4 4.3.5.1.8.4	A	Extreme SEE	APs shall be designed to not produce an unsafe condition or one that would cause damage to external equipment as a result of extreme single event effect ionizing radiation assuming	a1) Development and submittal of analysis summary that demonstrate AP equipment/ subsystems using the operational lifetime and parts	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					exposure levels specified in SSP 30512, para. 3.2.2. Verification that equipment and subsystems are designed to not produce an unsafe condition or one that could cause damage to equipment external to the payload as a result of exposure to extreme SEE ionizing radiation shall be by analysis.	characterization data to assure that the design meets the requirement when exposed to extreme SEE ionizing radiation does not produce an unsafe condition or one that could cause damage to equipment external to the AP as a result of exposure to extreme SEE ionizing radiation.			
					An analysis of equipment and subsystems shall be performed using the operational lifetime and parts characterization data to assure that the design meets the requirement when exposed to extreme SEE ionizing radiation. The verification shall be considered successful when the analysis shows that the AP equipment and subsystems will not produce an unsafe condition or one that could cause damage to equipment external to the AP when exposed to the specified environment.	a2) Analysis and testing to verify radiation dose (specified in SSP 30512, par 3.2.2 with margin of two) does not impede operations or creates a hazard to attached payload/other equipment due to SEE. b) JSC review, inspection and acceptance of AP SEE analysis to assure AP will not produce an unsafe condition or one that could cause damage to equipment external to AP when exposed to the specified environment.			
135	IRD SSP 57003	3.5.1.12 4.3.5.1.12	A	Acceleration Environment	A. AP/UCC shall meet structural integrity requirements in an on-orbit acceleration environment having peak transient accelerations of up to 0.2 g's, a vector acting in any direction. An analysis shall be performed to verify that the Attached Payload will withstand on-orbit accelerations as defined in paragraph 3.5.1.12.A. This analysis shall be based on lower level component qualification data as well as test verification of Attached Payload primary structure to equivalent static loads equal to or greater than the specified on-orbit environment. The verification shall be considered successful when the analysis shows that the Attached Payload design will withstand specified on-orbit accelerations and loads.	a1) Development, and submittal of analysis that demonstrate attached payload will withstand on-orbit accelerations as defined in paragraph 3.5.1.12.A based on lower level component qualification data and primary structure to equivalent static loads equal to or greater than the specified on-orbit environment. (with safety margins for peak transient accelerations up to 0.4 g's in any vector direction).	A	Data Cert per 52005	
					B. During payload installation, the AP/UCC shall meet the structural integrity requirements having peak transient accelerations of up to 0.4 g's, a vector quantity in any direction. An analysis shall be performed to verify that the Attached Payload will withstand on-orbit accelerations during berthing of the AP as defined in paragraph 3.5.1.12.CB. This analysis shall be based on lower level component qualification data as well as test	b1) Submittal of analysis that demonstrate AP analysis to verify withstanding of on-orbit accelerations during berthing of the AP as defined in paragraph 3.5.1.12.C based on lower level component qualification data and test verification of AP primary structure to equivalent static loads equal to or greater than the specified on-orbit environment.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					verification of AP primary structure to equivalent static loads equal to or greater than the specified on-orbit environment. The verification shall be considered successful when the analysis shows that the AP design will withstand specified on-orbit accelerations and loads.	c) JSC review, inspection and acceptance of AP analysis to assure ability to withstanding of on-orbit accelerations during berthing and on orbit accelerations based on lower level component qualification data and test verification of primary structure to equivalent static loads equal to or greater than the specified on-orbit environment.			
136	IRD SSP 57003	3.5.1.13 4.3.5.1.13	A	Vibration Environment	AP components weighing less than 300 lbm shall be designed to withstand the on-orbit linear peak vibration levels specified in Figure 3.5.1.13-1. An analysis shall be performed to show that Attached Payload operating equipment shall withstand the specified on-orbit linear peak vibration environment. The analysis shall be based on component tests. The verification shall be considered successful when the analysis shows that the operating equipment can withstand the requirement as specified.	a1) Development and submittal of analysis summary that demonstrates AP to show that operating equipment shall withstand the specified on-orbit linear peak vibration environment based on component tests. a2) Analysis, testing, and model survey correlation to verify that attached payload components less than 300 lbm are designed to withstand the on-orbit linear peak vibration levels specified in Figure 3.5.1.13-1 with safety margin. b) JSC review, inspection and acceptance of analysis summary that demonstrates AP operating equipment shall withstand the specified on-orbit linear peak vibration environment based on component tests.	A	Data Cert per 52005	
137	IRD SSP 57003	3.6.1 4.3.6.1	A	Materials Parts and Selection	Materials and processes used in the design and fabrication of the attached payload facility and associated support hardware shall comply with NSTS 1700.7, ISS Addendums Analysis shall be conducted to verify NSTS 1700.7 ISS Addendum requirements have been met by inspection of AP drawings.	a1) Analysis and testing to assure compliance with NSTS 1700.7, Para. 209 to demonstrate compliance with JSC 09604. a2) Development and submittal of analysis and inspection summaries that demonstrate AP materials meet NSTS 1700.7 ISS Addendum requirements in accordance with AP drawings	A&I,	CofC	Is it applicable to require this of the fabrication facilities?
					Analysis shall be conducted to verify NSTS 1700.7 ISS Addendum requirements have been met by inspection of AP drawings. Verification shall be considered successful when the MSFC and/or JSC Materials Analysis and Evaluation Boards (or equivalent) approved the selection and use of all materials comprising the AP. The AP developer will be required to provide this approval to the PSRP in order to close	a3) MSFC and/or JSC Materials Analysis and Evaluation Boards (or equivalent) approved the selection and use of all AP materials. b) AP and JSC PSRP approval of AP Payload Safety Hazard Reports.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					associated Payload Safety Hazard Reports.				
138	IRD SSP 57003	3.6.1.1 4.3.6.1.1	A	Thermal Vacuum Stability	Non-metallic materials exposed to space vacuum shall have low outgassing characteristics as defined by the total mass loss of less than 1.0% and a volatile condensable material of less than 0.1% when tested per ASTM -E595.	a) Development and submittal of inspection summary to demonstrate AP non-metallic materials are tested per ASTM-E595 when the payload developer certifies that all non-metallic materials have a Total Mass Loss of <1.0 percent and a volatile condensable material of <0.1 percent when tested per ASTM-E595.	I, Data Cert and JSC Materials Approval		
					Verification that AP non-metallic materials are tested per ASTM-E595 shall be by inspection. The verification shall be considered successful when the payload developer certifies that all non-metallic materials have a Total Mass Loss of <1.0 percent and a volatile condensable material of <0.1 percent when tested per ASTM-E595 or have obtained approval from the cognizant NASA materials organization for usage of materials not meeting the specified criteria in the intended use application.	a2) Development and submittal of inspection summary to demonstrate AP non-metallic materials have obtained approval from the cognizant NASA materials organization for usage of materials not meeting the specified criteria in the intended use application. b) JSC/MSFC review, inspection and acceptance to assure attached payload materials are tested per ASTM-E595			
139	IRD SSP 57003	4.3.6.2	A	Commercial Parts	COTS parts for the AP hardware shall meet the requirements specified in NSTS 1700.7, ISS Addendum, para. 208.3 and 209. Verification that COTS parts meet the requirements of NSTS 1700.7 ISS Addendum shall be performed and submitted to the PSRP in accordance with NSTS 13830. Verification shall be considered successful when COTS parts are shown to meet the requirements of NSTS 1700.7 ISS Addendum.	a) Development and submittal of analysis summary that demonstrate AP COTS parts meet the requirements of NSTS 1700.7 ISS Addendum b) JSC PSRP review, inspection and acceptance of analysis summary and applicable hazard report to assure COTS parts are shown to meet the requirements of NSTS 1700.7 ISS Addendum	Safety and HR SVM References	CofC	
140	IRD SSP 57003	3.6.3 4.3.6.3	A	Cleanliness	AP hardware external surfaces shall conform to Visibly Clean Standard specified in SN-C-0005. Verification that AP hardware external surfaces conform to visibly clean-standard cleanliness requirements as specified in SN-C-0005, NSTS Contamination Control Requirements Manual shall be by inspection.	a) Development and submittal of inspection summary that demonstrates AP hardware external surfaces conform to visibly clean-standard cleanliness requirements as specified in SN-C-0005	I	CofC	
					An inspection of the hardware as specified in SN-C-0005 shall be performed to show that the AP hardware meets the visibly clean-standard requirement. Verification shall be considered successful when the inspection shows the AP hardware external surfaces meets the requirements for visibly clean-standard specified in SN-C-0005.	b) JSC review, inspection and acceptance of attached payload inspection summary to assure hardware and external surfaces meet the visibly clean-standard requirement as specified in SN-C-0005.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
141	IRD SSP 57003	3.6.4 4.3.6.4	A	Atomic Oxygen Interaction	The contribution to the molecular column density created by an attached payload along any unobstructed line of sight shall not exceed 1X10+14 molecules/cm2/for any individual species, when viewed from any other attached payload location. Verification shall be by inspection. Verification shall be considered successful when a drawing inspection shows that no silver plated hardware is used.	a1) Development and submittal of inspection summary and drawings demonstrates AP shows that no silver plated hardware is used. a2) Analysis of attached payload molecular column density that demonstrate less than 1X10+14 molecules/cm2 when viewed from any other attached payload location b) JSC review, inspection and acceptance of AP inspection summary and drawings to assure that no silver plated hardware is used.	I	CofC	
142	IRD SSP 57003	3.7.1 4.3.7.1	A	Equipment Requiring Robotic Support	B. An AP requiring SRMS support shall provide a clearance zone from the GF centerline in accordance with NSTS 21000-IDD-ISS, para 14.4.2 . This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	b1,c1,d1,e1) Design review against hardware and drawing to verify compliance with NSTS 21000-IDD to assure clearance zones (para. 14.4.2), GF accommodations ( paras. 14.4.1.1, 14.4.1.2, 14.4.3), location, mass handling capacity (para. 14.1.5), scuff plates (Figure 3.3.1.1.2.2-1), and capture envelope (Table 3.7.1-1)	I,I,I,A (CG Data Cert), A (FEM/Data Cert), I,I (AR), I,A,A (Data Cert/VCL), D&A	CofC	No requirements specified?
					C. An AP requiring SRMS support shall accommodate the GF centerline in accordance with NSTS 21000-IDD-ISS, paras. 14.4.1.1, 14.4.1.2, 14.4.3 This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.				
					D. An AP requiring SRMS support shall define the location of the GF in the unique attached payload ICD. This requirement shall be verified by inspection of flight drawings in the unique Attached Payload hardware ICD. The verification shall be considered successful when the inspection shows compliance with the requirement as specified. An AP requiring SRMS support shall be within the certified mass handling capacity of the SRMS in accordance with the payload mass noted in NSTS 21000-IDD-ISS, para 14.1.5 This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	g1) Vibration testing to demonstrate compliance with NSTS-21000 IDD-ISS paragraph 14.4.5.2 h1) Design review against hardware and drawing to verify electrical interfaces in accordance with NSTS 21000-IDD-ISS (para. 14.4.6) and SSP 30245 (paras. 3.2.1, 3.3, and 4.0 k1) Design review of hardware and drawing to verify shielding of critical and hazardous attached payload components			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					G. The vibration frequency of an AP requiring SRMS support shall be in accordance with NSTS-IDD-ISS, para 14.4.5.2 This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					H. An AP requiring SRMS support shall electrical interface with the GFs ground strap whose length, gauge, and general outline are in accordance with the payload mass noted in NSTS 21000-IDD-ISS, para 14.4.6, and SSP 30245, sections 3.2.1.3, 3.3, and 4.0. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified. I.	n1) Design review of hardware and drawing to verify shielding of critical and hazardous attached payload components n2) Testing of electrical interfaces and attached payload hardware to demonstrate positive latch indication stati. b2,c2,h2,i2,,j2) Development and submission of AP inspection summary of flight drawings that demonstrate compliance with the requirement as specified. d2) Development and submission of AP inspection summary of flight drawings in unique AP hardware ICD to verify compliance with the requirement as specified.			
					An AP requiring SRMS support shall provide thermal isolation between the payload and the GF by installing thermal isolation washers and bushings provided with the GF in accordance with NSTS 21000-IDD-ISS, figure 14.4.7.4-1 This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified				
					J. An AP requiring SRMS support shall provide scuff plates in accordance with NSTS 21000-IDD-ISS, figure 3.3.1.1.2.2.2-1 This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.				
					K. An AP requiring SRMS support shall shield critical and hazardous components from contact with other objects during robotic operations . This requirement shall be verified by analysis.	e2,g2,k2,m2). Development and submission of AP analysis summary to verify compliance with the requirement			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					The verification shall be considered successful when the analysis shows compliance with the requirements as specified.	as specified.			
					M. An AP (requiring SRMS support) berthing mechanisms shall have a capture envelope larger than the SRMS placement accuracy specified in Table 3.7.1-1 when using just the SRMS This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					N. An AP requiring SRMS support shall provide ready to latch indication to positively indicate when the two pieces of equipment are place within the berthing mechanism's envelope. This requirement shall be verified by analysis or demonstration. The verification shall be considered successful when the analysis or demonstration shows compliance with the requirements as specified.	n3) Development and submission of AP analysis/demonstration summary to show compliance with the requirements as specified. o) JSC review, inspection and acceptance of attached payload inspection and analysis summary to assure equipment requiring shuttle robotic support meets specified requirements			
143	IRD SSP 57003	3.7.2 4.3.7.2	A	External Equipment Requiring Robotic Handoff	An AP requiring robotic handoff shall be equipped with a minimum of one GF for each robot. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.		I	CofC	No requirements specified?
144	IRD SSP 57003	3.7.3 4.3.7.3	A	External Equipment Requiring SSRMS Support	A) An AP requiring SSRMS support shall Interface with the SSRMS Latching End effector using a power data GF, Power video GF, or a Shuttle GF that is compatible with SSRMS LEE as specified in SSP 42004 , Table 1.4.1.2-1. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	a1) Design review against drawings to verify attached payload to SSRPMS interface in accordance with SSP 42004 , table 1.4.1.2-1	I,I (FEM) ,A &r D, I,A,A, A (Data Cert/VCL,I	CofC	No requirements specified?
					B. An AP requiring SSRMS support shall Be within the robotic properties of Table 3.7.3-1. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as	b1) Design review against hardware and drawing to verify compliance table 3.7.3-1 for mobile servicing properties. a2,b2,f2) Development, and submittal of AP inspection summary of flight drawings to show compliance with the			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					specified.	requirement as specified.			
					D. An AP requiring SSRMS support shall and not using the SSRMS programmable force /moment accommodation), shall provide capture, berthing, and closure drive capability to overcome the backdrive thresholds (static friction) defined in table 3.7.3-3 and complete the closure of the capture/berthing operation when the SSRMS is limp with no motor current with brake joints off). This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	d1) Analysis and testing to verify capture/berthing/and closure forces/moments that overcome static friction per table 3.7.3-3 e1) Analysis and testing to demonstrate ready to latch indication to positively indicate that the 2 pieces of equipment are placed within the berthing mechanism's envelope			
					E. An AP requiring SSRMS support shall provide ready to latch indication to positively indicate that the 2 pieces of equipment are placed within the berthing mechanism's envelope. This requirement shall be verified by analysis or demonstration. The verification shall be considered successful when the analysis or demonstration shows compliance with the requirements as specified.	e2. Development and submittal of AP summary analysis or demonstration that shows compliance with the requirements as specified.			
					F. An AP requiring SSRMS support shall in the shuttle cargo bay) provide scuff plates in accordance with NSTS 21000-IDD-ISS, figure 3.3.1.1.2.2.2 and Figure 3.3.1.1.2.2.2-1 to limit motion in the Orbiter port and starboard directions during berthing/unberthing from the Orbiter. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	f1 and j1) Design review against hardware and drawing to verify compliance scuff plates (NSTS 21000 Figure 3.3.1.1.2.2.2-1), and capture envelope (NSTS 21000, Table 3.7.1-1)			
					G. An AP requiring SSRMS support shall shield critical and hazardous components from contact with other objects during operations. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	g1) Design review of hardware and drawing to verify shielding of critical and hazardous attached payload components			
					I. An AP requiring SSRMS support shall be designed such that its needs for the programmable backdrive after the initial contact are within the SSRMS programmable force/moment accommodation capability of Table 3.7.3-4, when the SSRMS elbow joint	i1) Analysis and testing to demonstrate that programmable backdrive (after the initial contact are within the SSRMS) programmable force/moment accommodation capability of Table 3.7.3-4, when the			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					angle is not less than 60 degrees from the straight arm configuration and the moment distance between the GF and berthing contact point is 14.76 ft(4.5m).	SSRMS elbow joint angle is not less than 60 degrees from the straight arm configuration and the moment distance between the GF and berthing contact point is 14.76 ft(4.5m)			
					This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					J. An AP requiring SSRMS support shall (requiring SSRMS support) have a capture envelop larger than the SSRMS placement accuracy specified in Table 3.7.1-1 when using just the RMS. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	o) JSC review, inspection and acceptance of AP inspection, analysis, and demonstration summaries to assure compliance with requirements as specified in SSP 42002, and NSTS 21000, and IRD SSP 57003 Table 3.7.3-4.			
					K. An AP requiring SSRMS support shall define the location of the GF in the unique attached payload hardware ICD. This requirement shall be verified by inspection of flight drawings in the unique Attached Payload hardware ICD. The verification shall be considered successful when the inspection shows compliance with the requirements as specified.	k1) Design review against hardware to verify location of the attached payload GF in the unique ICD. d2,g2,i2,j2). Development, and submittal of AP analysis summary that shows compliance with the requirement as specified. k2. Development and submittal of AP inspection summary of flight drawings in the unique Attached Payload hardware ICD that shows compliance with the requirements as specified.			
145	IRD SSP 57003	3.7.3.1 4.3.7.3.1	A	Equipment Requiring SSRMS Support using NSTS System Grapple Fixture	A. The AP requiring SSRMS support shall provide a clearance envelope around the GF as specified in SSP 42004, para 13.2.2.1. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	a1,b1,e1&g1) Analysis, tests, and inspection of design against hardware to verify clearance, accommodations, vibration, and electrical interface to assure compliance with SSP 42004, para. 13.2.2.1(Clearance), 13.2.2.2 (accommodations), A3.2.2.3.2 (vibration Frequency), and electrical interface ( 13.2.2.5.1)	1,1,a (FEM),1(AR),I	CofC	
					B. The AP requiring SSRMS support shall accommodate the GF in accordance with SSP 42004, section 13.2.2.2. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					E. The vibration frequency of an AP shall be in accordance with SSP 42004, A3.2.2.3.2. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirements as specified.	f1) Design review and TPSs to assure that isolation washers are installed in between the GF and attached payload interface in accordance with NSTS 21000 IDD-ISS, figure 14.7.4-1			
					F. An AP requiring SSRMS support shall provide thermal isolation between the payload and the GF by installing the thermal isolation washers and bushings provided with the GF in accordance with NSTS 21000 IDD-ISS, Figure 14.4.7.4-1. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirements as specified.	a2,b2,f2,g2) AP development and submission of inspection summary of flight drawings to compliance with the requirement as specified.			
					G. An AP requiring SSRMS support shall eclectically interface with the GFs in accordance with SSP 42004, Section 13.2.2.5.1. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirements as specified.	e2) AP development and submittal of analysis that shows compliance with the requirements as specified. o) JSC review, inspection and acceptance AP inspection and analysis summaries to assure compliance with specified requirements.			
146	IRD SSP 57003	3.7.3.2 4.3.7.3.2	A- 57003 NA-57213	Equipment requiring SSRMS using a power Data Grapple Fixture	A. An AP requiring SSRMS support shall provide a clearance envelope as specified in SSP 42004, para. A3.2.2.1. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	a,c,e,f,g. Development, and submittal of inspection summary that demonstrates AP inspection shows compliance with the requirement as specified.	I,A&I (Data Cert,VCL), I, A (DataCert for Voltage vs. f), I,I,I,A(AR), A	CofC	All verifications are listed as TBD
					B. An AP requiring SSRMS support shall provide a structural and mechanical interface in accordance with SSP 42004, Para, A3.2.2.2 and section A3.2.2.3, and NSTS 21000 IDD-ISS para. 14.3.2-2 (sheets one and 2). This requirement shall be verified by inspection of flight drawings and analysis. The verification shall be considered successful when the inspection and analysis shows compliance with the requirement as specified.				
					C. An AP requiring electrical power from the SSRMS shall interface with ther PDGF in accordance with SSP 42004, para. A.3.2.2.5 and A.3.2.2.5.2 . This requirement shall be verified by inspection of flight drawings and considered	b. Development and submittal of inspection and analysis summary that demonstrates AP shows compliance with the requirement as specified.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					successful when the inspection shows compliance with the requirement as specified.				
					D. An AP requiring electrical power from the SSRMS shall operate from electrical power provided in accordance with SSP 42004, A3.2.2.5.1. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	d,h,i. Development, and submittal of analysis summary that demonstrates compliance with the requirement as specified.			
					E. An attached payload requiring data from the SSRMS shall interface with the PDGF in accordance with SSP 42004, A3.2.2.6. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	o) JSC review, inspection and acceptance of AP inspection and analysis summary to assure compliance with specified requirements.			
					F. An attached payload requiring video interface with the SSRMS shall interface with the PDGF in accordance with SSP 42004, A3.2.2.7. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.				
					G. An attached payload requiring electrical interface with the SSRMS shall accommodate the PDGF harness and provide connectors in accordance with SSP 42004, A3.2.2.4. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.				
					H. An attached payload requiring SSRMS support shall limit the thermal conductance from the payload to the PDGF in accordance with SSP 42004, A3.2.2.8.1. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					I. An attached payload requiring SSRMS support shall comply with the EME of SSP 42004 A3.2.2.9.1. This requirement shall be				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
147	IRD SSP 57003	3.7.3.3 4.3.7.3.3	A	Equipment Requiring SSRMS support using a PVGF	A. An attached payload requiring SSRMS support shall provide a clearance envelope as specified in SSP 42004, para.TBD. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	a,c,e,f,g) Development and submittal of inspection summary that demonstrates AP compliance with the requirement as specified in SP 42004 and IDD 21000.	I,A&I (Data Cert,VCL), I, A (DataCert for Voltage vs. f), I,I,I,A(AR), A 57213 exception E7	CofC	A lot of TBDs
					B. An attached payload requiring SSRMS support shall provide a structural and mechanical interface in accordance with SSP 42004, Para. TBD and section TBD, and NSTS 21000 IDD-ISS para. TBD. This requirement shall be verified by inspection of flight drawings and analysis. The verification shall be considered successful when the inspection and analysis shows compliance with the requirement as specified.				
					C. An AP requiring SSRMS support shall provide Electrical power from the SSRMS shall interface with ther PVGF in accordance with SSP 42004, para. TBD. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	b) Development and submittal of analysis and inspection summary that demonstrates AP compliance with the requirement as specified.			
					D. An AP requiring SSRMS support shall provide electrical power from the SSRMS shall operate from electrical power provided in accordance with SSP 42004, Para. TBD. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					E. An AP requiring SSRMS support shall provide Data from the SSRMS shall interface with the PVGF in accordance with SSP 42004, Para. TBD. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	d,h,i) Development, and submittal of analysis summary that demonstrates AP compliance with the requirement as specified in SSP 42004 and IDD 21000.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					F. An AP requiring SSRMS support shall provide Video interface with the SSRMS shall interface with the PVGF in accordance with SSP 42004, Para. TBD. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					G. An AP requiring SSRMS support shall provide electrical interface with the SSRMS shall accommodate the PVGF harness and provide connectors in accordance with SSP 42004, Para. TBD. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.	o) JSC review, inspection and acceptance of AP analysis and inspection summaries to assure compliance with specified requirements.			
					H. An AP requiring SSRMS support shall provide SSRMS support shall limit the thermal conductance from the payload to the PVGF in accordance with SSP 42004, Para. TBD. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
					I. An AP requiring SSRMS support shall provide SSRMS support shall comply with the EME of SSP 42004 , Para. TBD. This requirement shall be verified by analysis. The verification shall be considered successful when the analysis shows compliance with the requirement as specified.				
148	IRD SSP 57003	3.7.4 4.3.7.4	A- 57003 NA-57213	External Equipment Requiring Dexterous Robotic Support	A. An AP requiring dexterous robotic support shall provide a dexterous handling interface in accordance with SSP 42004, section C3.2 (excluding 3.2.2.3) for SDGF, on paras. D3.2 for MCF or Para. G3.2 for bare bolt interfaces or paragraph H3.2 (excluding 3.2.2.3.3) for modified MCFs or Paras. K3,2 for modified MCFs.	a) Development, and submittal of inspection and analysis summary that demonstrates AP compliance with the requirement as specified.	I&A, A&I, A, I	CofC	verification a and e have no requirements specified
					This requirement shall be verified by inspection and analysis. The verification shall be considered successful when the inspection and analysis show compliance with the requirement as specified.				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B.An AP requiring dexterous robotic support shall be within the mass properties, volume, and frequency limits as specified in Table 3.7.4-1. An analysis and inspection of flight element drawings shall be performed to verify that dexterous external equipment is as specified.	b1) Development, and submittal of analysis and inspection summary that demonstrates AP flight element drawings are performed to verify dexterous external equipment is as specified.			
					A mass properties analysis shall be performed to verify the mass properties requirement, an inspection of flight element drawings shall be performed to verify the volume constraint, and a structural analysis shall be performed to verify the frequency requirement. The verification shall be considered successful when the inspection and analysis show compliance with the requirement.	b2) Development, and submittal of analysis and inspection summary that demonstrates AP compliance with mass properties, volume constraint, and a frequency requirements (structural analysis).			
					C. An AP requiring dexterous robotic support shall be in accordance with SSP 30550 Volume 1, Para. 3.2.1.5, 3.2.2.4, 3.4.1.1 (excluding 3.4.1.1.5/3.4.1.1.6), 3.43.4.2.1.4, 3.4.2.1.5, 3.4.2.2 (excluding 3.4.2.2 {1.3/1.8/1.10/4/2.5}), 3.4.3, 3.4.4.1, 3.4.6, 3.4.7.2.1, 3.4.8.1.1.3, 3.4.9.2.1, 3.4.9.2.1, 3.4.9.2.5, 3.4.9.2.6, 3.4.13, 3.4.15, 3.5.3.1, 3.5.3.2 as modified by the following: c.1) Equipment designed to be actuated by dexterous robotic arm motion shall require actuation only along a straight lines or a series of straight lines of motion.	c. Development, and submittal of analysis summary that demonstrates AP equipment requiring dexterous robot support address verification data is in compliance with SSP 30550, Volume 1, paragraphs 4.3.2.1.5, 4.3.2.2.4, 4.3.4.1.1 (excluding 4.3.4.1.1.5 and 4.3.4.1.1.6), 4.3.4.2.1.4, 4.3.4.2.1.5, 4.3.4.2.2 (excluding 4.3.4.2.2.1.3, 4.3.4.2.2.1.8, 4.3.4.2.2.1.10, 4.3.4.2.2.4, and			
					c.2) Equipment designed to be actuated by forces and moments provided by a dexterous robotic arm shall require less than or up to the forces and moments defined in Table 3.7.4-2 and the force directions defined in 3.7.4-1. The equipment requiring dexterous robot support shall be verified by analysis.	4.3.4.2.2.5), 4.3.4.3, 4.3.4.4.1.5, 4.3.4.4.1.6, 4.3.4.6, 4.3.4.7.2.1, 4.3.4.8.1.1.3, 4.3.4.9.2.1, 4.3.4.9.2.5, 4.3.4.9.2.6, 4.3.4.13, 4.3.4.15, 4.3.5.3.1, and 4.3.5.3.2.			
					The analysis shall consist of analyzing verification data to show compliance with SSP 30550, Volume 1, paragraphs 4.3.2.1.5, 4.3.2.2.4, 4.3.4.1.1 (excluding 4.3.4.1.1.5 and 4.3.4.1.1.6), 4.3.4.2.1.4, 4.3.4.2.1.5, 4.3.4.2.2 (excluding 4.3.4.2.2.1.3, 4.3.4.2.2.1.8, 4.3.4.2.2.1.10, 4.3.4.2.2.4, and 4.3.4.2.2.5), 4.3.4.3, 4.3.4.4.1.5, 4.3.4.4.1.6, 4.3.4.6, 4.3.4.7.2.1, 4.3.4.8.1.1.3, 4.3.4.9.2.1, 4.3.4.9.2.5, 4.3.4.9.2.6, 4.3.4.13, 4.3.4.15, 4.3.5.3.1, and 4.3.5.3.2. The verification shall be considered successful when the analysis				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					shows the equipment meets the requirements as specified.				
					D. An AP requiring dexterous robotic support with the equipment that requires dexterous robotics support shall be verified by analysis. The analysis shall consist of analyzing verification data to show compliance with SSP 30550, Volume 1, paragraphs 4.3.3.1.1, 4.3.3.1.4, 4.3.3.1.5, 4.3.3.3.3, 4.3.3.3.5, 4.3.4.10.1.2, and 4.3.4.10.1.4. The verification shall be considered successful when the analysis shows the equipment meets the requirements as specified.	d) Development, and submittal of analysis that demonstrates AP worksites associated with equipment that requires dexterous robotics support in accordance with SSP 30550, Volume 1, paragraphs 4.3.3.1.1, 4.3.3.1.4, 4.3.3.1.5, 4.3.3.3.3, 4.3.3.3.5, 4.3.4.10.1.2, and 4.3.4.10.1.4.			
					Equipment designed to be actuated by dexterous robotic arm motion shall require actuation only along a straight lines or a series of straight lines of motion.	e) Development and submittal of inspection summary that demonstrates AP flight element drawings for equipment requiring temporary storage on the dexterous robot is compliant with the requirement as specified.			
					Equipment designed to be actuated by forces and moments provided by a dexterous robotic arm shall require less than or up to the forces and moments defined in Table 3.7.4-2 and the force directions defined in 3.7.4-1				
					E. An AP requiring dexterous robotic support requiring temporary storage on the dexterous robot shall be in accordance with SSP 42004, Section E	f) JSC review, inspection and acceptance of AP analysis and inspection summaries to assure compliance with requirements specified and SSP 30550.			
					An inspection of flight element drawings shall be performed to verify that the equipment requiring temporary storage on the dexterous robot is as specified. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.				
149	IRD SSP 57003	3.7.5 4.3.7.5	A- 57003 NA-57213	Equipment Requiring Robotic Translation	A. An AP requiring robotic translation support or temporary storage on the MSS shall be within the mass properties , volume, and frequency limits of table 3.7.5-1 for translation by the SSRMS or payload/ OUR accommodation located on the Mobile Servicing Center . This requirement shall be verified by analysis and inspection.	a1)Development and submittal of analysis summary to demonstrate AP mass property including mass, inertia, and CG offset are compliant with the requirement as specified. a2) Development and submittal of inspection summary to demonstrate AP flight element drawings are used to	I&A-FEM , Data Cert, CG I, I, A	CofC	Requirement not specified for a1,a2,a3, b, and c May be in conflict with 3.7.3.2 and 3.7.3.3

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						verify the diameter and length are compliant with the requirement as specified..			
					A mass property analysis shall be used to verify the mass, inertia, and CG offset. Inspection of flight element drawings shall be used to verify the diameter and length. Structural analysis shall be used to verify the minimum frequency. The verification shall be considered successful when the mass property analysis, inspection of flight element drawings, and structural analysis all show compliance with the requirement as specified.	a3) Development and submittal of structural analysis summary to demonstrates AP minimum frequency are compliant with the requirement as specified.			
					B. The distance between the AP SSRMS GF and the POA GF shall not exceed 16.5' (5 m). This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows that the distance between the SSRMS GF and the POA GF does not exceed the requirement as specified.	b) Development and submittal of inspection summary to demonstrate AP flight drawings show that the distance between the SSRMS GF and the POA GF does not exceed the requirement as specified.			
					C. The AP requiring robotic translation support shall not require electrical power, data, or video from the SSRMS LEE, MCAS, or POA during translation. This requirement shall be verified by inspection of flight drawings. The verification shall be considered successful when the inspection shows compliance with the requirement as specified.	c) Development and submittal of inspection summary to demonstrate AP flight drawings show compliance with the requirement as specified.			
					D. The AP requiring robotic translation support shall comply with robotics translation corridor as specified in SSP 41162, para. 3.2.2.7. Verification shall be by analysis. The verification shall be considered successful when the analysis shows the AP does not extend beyond the robotics translation corridor specified in SSP 41162, paragraph 3.2.2.7.	d) Development and submittal of analysis summary to demonstrate AP does not extend beyond the robotics translation corridor specified in SSP 41162, paragraph 3.2.2.7. e) JSC review, inspection and acceptance of AP analysis and inspection summaries to assure compliance with SSP 41162, para. 3.2.2.7			
150	IRD SSP 57003	3.7.6.1 4.3.7.6.1	A	EBCS Avionics Package Envelope and mounting	A. The payload developer shall accommodate the operational envelope, roll adjustments, and optical keep-out zone for the EBCS Avionics Package as defined in Figures 3.7.6.1-1/2.	a) Development, and submittal of inspection summary that demonstrates AP accommodates and does not obstruct the optical keep-out zone as defined in Figures 3.7.6.1-1 and 3.7.6.1-2.	I, A&I, A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Verification shall be by inspection of design drawings. Verification shall be considered successful when the inspection shows that the payload has accommodated and does not obstruct the optical keep-out zone as defined in Figures 3.7.6.1-1 and 3.7.6.1-2.				
					B. The payload shall locate the EBCS Avionics package as defined in SSP 57004, figure 3.7.1-1 with an error of $\pm 0.125$ ", $\pm 0.25$ ", and $0.2$ " about the X/YZ axis and lateral offset (X-y plane about the Z axis (alpha-a) of $L/0.182+a/0.4=1$ . Verification shall be by inspection of design drawings and analysis.	b) Development, and submittal of inspection summary that demonstrates EBCS Avionics Package is located as defined in Figure 3.7.6-1 and paragraph 3.7.6.1.B, and mechanically interfaces with the AP in accordance with paragraph 3.7.1-1 of the unique payload ICD, respectively.			
					Verification shall be considered successful when the inspection and analysis show that the EBCS Avionics Package is located as defined in Figure 3.7.6-1 and paragraph 3.7.6.1.B, and mechanically interfaces with the payload in accordance with paragraph 3.7.1-1 of the unique payload ICD, respectively.				
					C. The payload shall maintain the location of the EBCS avionics package mounting surface as specified in B above after exposure to vibration and impact loads and during exposure to the on-orbit thermal environment conditions specific herein. Verification shall be by analysis.	c) Development and submittal of analysis summary that demonstrates EBCS Avionics Package mounting surface provided by AP maintains EBCS mounting location as specified in 3.7.6.1.B after exposure to vibration and impact loads and during exposure to the on-orbit thermal environment.			
					Verification shall be considered successful when an analysis shows that the EBCS Avionics Package mounting surface provided by the payload maintains the EBCS mounting location as specified in 3.7.6.1.B after exposure to vibration and impact loads and during exposure to the on-orbit thermal environment.	d) JSC review, inspection and acceptance of AP inspection and analysis summaries to assure compliance with unique payload ICD and IRD SSP 57003, Figures 3.7.6-1/3.7.6.1-1/ 3.7.6.1-2. and paragraphs 3.7.6.1, 3.7.1-1..			
151	IRD SSP 57003	3.7.6.2 4.3.7.6.2	A	EBCS Avionics Package Power	A. Verification shall be by inspection of design drawings and demonstration. Verification shall be considered successful when the inspection shows that the payload has routed the PVGF cable to the EBCS Avionics Package connectors as specified in paragraph 3.7.6.2 and a demonstration indicates that power is available from the PVGF cable.	a) Development and submittal of inspection and demonstration summary that demonstrates AP has routed PVGF cable to EBCS Avionics Package connectors as specified in paragraph 3.7.6.2 and indicates that power is available from the PVGF cable.	I&D	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Verification shall be by inspection of design drawings and demonstration. Verification shall be considered successful when the inspection shows that two heater busses are provided to the EBCS Avionics Package and when demonstration shows that the required keep-alive heater power is available from each heater bus	b) Development and submittal of inspection and demonstration summary that demonstrates two heater busses are provided to the EBCS Avionics Package and required keep-alive heater power is available from each heater bus.			
						c) JSC review, inspection and acceptance of AP inspection and demonstration summaries to assure EBCS Avionics Package connectors as specified in paragraph 3.7.6.2, power is available from the PVGF cable, two heater busses are provided to the EBCS Avionics Package, and required keep-alive heater power is available from each heater bus.			
152	IRD SSP 57003	3.7.6.4 4.3.7.6.4	A	EBCS Vibration Environment	The payload shall not exceed the vibration limits in Table 3.7.6.4-1. Verification shall be by analysis. Verification shall be considered successful when the analysis shows that the EBCS vibration limits, as defined in Table 3.7.6.4-1, have not been exceeded.	a) Development, and submittal of analysis that demonstrates AP to EBCS vibration limits, as defined in Table 3.7.6.4-1, are not been exceeded b) JSC review, inspection and acceptance of AP analysis that demonstrates EBCS vibration limits, as defined in Table 3.7.6.4-1, are not been exceeded.	A	CofC	
153	IRD SSP 57003	3.7.6.5 4.3.7.6.5	A	EBCS Avionics Package Video	The payload shall route the PVGF cable to the EBCS Avionics package and provide connections as indicated in SSP 57004, Figure 3.7.2-1. APs shall be designed : A) Such that all operations are performed via EVR with EVA contingency capability	a) Development and submittal of inspection and demonstration summary that demonstrates AP routed PVGF cable to EBCS Avionics Package connectors as specified in paragraph 3.7.6.5 and a demonstration that required video/synchronization signals are available from the PVGF, via the PVGF cable.	I&D	CofC	
					B) to the sharp edge, protrusion, and glove temperature requirements of NSTS 07700, Vol XIV, Appendix 7 even if EVA is not planned or anticipated Verification shall be by inspection of design drawings and demonstration.	b) JSC review, inspection and acceptance of AP inspection and demonstration summary to assure AP routed PVGF cable to EBCS Avionics Package connectors as specified in paragraph 3.7.6.5 and a demonstration video/synchronization signals are available from the PVGF, via the PVGF cable.			
					Verification shall be considered successful				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					when the inspection shows that the payload has routed the PVGF cable to the EBCS Avionics Package connectors as specified in paragraph 3.7.6.5 and a demonstration indicates that the required video and synchronization signals are available from the PVGF, via the PVGF cable.				
154	IRD SSP 57003	3.8 4.3.8	A	EVA	A. The payload shall route the PVGF cable to the EBCS Avionics package and provide connections as indicated in SSP 57004, Figure 3.7.2-1. APs shall be designed such that all operations are performed via EVR with EVA contingency capability. EVA contingency operations shall be verified by analysis, demonstration and inspection.	a) Development and submittal of analysis, inspection, and demonstration summary that confirms EVA contingency activity performed at the end of the SSRMS or from existing ISS worksites is in accordance with NSTS 07700, Volume XIV, Appendix 7.	A&D&I	CofC	
					Verification will be considered successful when the analysis, demonstration and inspection confirms all EVA contingency activity performed at the end of the SSRMS or from existing ISS worksites, is in accordance with NSTS 07700, Volume XIV, Appendix 7.				
					B. The payload shall provide 2 heater busses, each capable of delivering 25W to the Avionics Package for keep alive heater power.	b1) Operational hazard assessment to identify EVA hazards related to sharp edges, protrusions, and thermal extremes			
					APs shall be designed such that all operations are performed via EVR with EVA contingency capability to the sharp edge, protrusion, and glove temperature requirements of NSTS 07700, Vol XIV, Appendix 7 even if EVA is not planned or anticipated. Verification shall be by analysis and inspection. Verification will be considered successful when the analysis and inspection confirm that the design is in accordance with NSTS 07700, Volume XIV, Appendix 7.	b2) Development and submittal of analysis, inspection, and demonstration summary that confirms AP EVA design is in accordance with NSTS 07700, Volume XIV, Appendix 7. c) JSC review, inspection and acceptance of AP			
155	IRD SSP 57003	3.8.1 4.3.8.1	A	EVA as backup for Robotic Activities	A) EVA aids shall be provided in the locations necessary to support SSRMS based EVA contingency operations as specified in SSP 50005, para 12.3	a) Development and submittal of analysis summary that demonstrates AP EVA backup provisions are provided in accordance with SSP 50005, paragraph 12.3. Verification shall be successful when the analysis shows compliance with the requirements in 3.8.1 A, B and C.	A	CofC	
					B) All loose equipment and cargo operated on	b) JSC review, inspection and			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					or by and EVA crewmember shall have attachment points or restraints so it can be secured or tethered at all times during the transfer and at the worksite during EVA contingency operations as specified in SSP 50005, para. 12.3	acceptance of AP analysis summary to assure AP EVA backup provisions are provided in accordance with SSP 50005, paragraph 12.3. Verification shall be successful when the analysis shows compliance with the requirements in 3.8.1 A, B and C.			
					C) EVA worksites shall provide a force reduction mechanism within 24 " of the task site when the EVA forces are greater than 10lbf are anticipated. An analysis of AP flight drawings shall be used to verify that manual EVA backup provisions have been provided in accordance with SSP 50005, paragraph 12.3 and compliant with 57003 paras. 3.8.1 A, B and C.	c) Development and submittal of analysis summary that demonstrates AP EVA backup provisions of EVA hardware of mechanisms with greater than 10lbf to identify and implement force reduction mechanisms. d) JSC review, inspection and acceptance of AP analysis that demonstrates compliance with SSP 50005, paragraph 12.3, 10#f constraint, and force reduction methods.			
156	IRD SSP 57003	3.8.2 4.3.8.2	A	EVA Transition	Attached payloads shall provide for EVA translation for contingency operations. Verification shall be by analysis. .	a1) Development and submittal of analysis summary that demonstrates AP defining on-orbit configuration and EVA contingency operations analysis to verify AP EVA translation paths exist only for the purpose of removing the SSRMS from a grapple fixture. (para. 3.1.3.1.1.3A. ) .	A	CofC	
					The analysis shall be based on documentation defining the AP on-orbit configuration and EVA contingency operations analysis. The verification shall be considered successful when the analysis shows that EVA translation paths on AP exist only for the purpose of removing the SSRMS from a grapple fixture	a2) Development, and submittal of AP EVA contingency operations analysis. b) JSC review, inspection and acceptance of AP EVA contingency operational analysis for removing the SSRMS from a grapple fixture			
157	IRD SSP 57003	3.8.2.1 4.3.8.2.1	A	PAS/UCCAS Interface Clearances	APs shall be designed not to violate PAS/UCCAS EVA access envelopes as defined in paragraph 3.1.3.1.1.3A to allow for attach site ORU removal and replacement.	a) Development, and submittal of inspection summary that demonstrates APs do not violate the EVA access envelopes as defined by par. 3.1.3.1.1.3A.	I	CofC, SSP 57213 Exception E8	
					An inspection of the design and installation drawings shall be performed to verify that the Attached Payloads do not violate the EVA access envelopes as defined by par. 3.1.3.1.1.3A. Verification shall be considered successful when the inspection confirms that the EVA access envelopes are not violated.	b) JSC review, inspection and acceptance of AP inspection summary that demonstrates APs do not violate the EVA access envelopes as defined by par. 3.1.3.1.1.3A.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
158	IRD SSP 57003	3.8.2.2 4.3.8.2.2	A	EVA Translation Corridor Protrusion	APs impinging on EVA translation corridors and worksites shall provide for EVA fixtures serving the same functions as those obscured by the payload as specified in SSP 50005, para. 14.5.3. Verification shall be by analysis and inspection. The inspection shall be based on models and drawings of the on orbit PAS/UCCAS installed AP.	a) Development, and submittal of analysis and inspection summary that demonstrates AP based on models and drawings of the on orbit PAS/UCCAS installed AP and ensure translation corridor protrusions are in accordance with SSP 50005 para 14.5.3. .	A&I	CofC	
					An analysis shall be performed to ensure that in the event of a translation corridor protrusion, appropriate fixtures are provided to maintain intended function. The verification shall be considered successful when the on orbit installed AP configuration allows for EVA translation in accordance with SSP 50005.	b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure models/drawings of the on orbit PAS/UCCAS are properly installed and ensure translation corridor protrusions are in accordance with SSP 50005			
159	IRD SSP 57003	3.8.3.1 4.3.8.3.1	A	Crew Access Dimensions	The AP shall provide sufficient free volume for the crew per figures 3.8.3.1.1.1-1 and 3.9.1.7.1.1-1 to perform their contingency, operations, and maintenance tasks as well as accommodate tools and equipment used in these tasks.	a) Development, and submittal of demonstration summary that shows AP hardware accessibility is sufficient to remove, replace, operate and maintain integrated Attached Payload equipment per figures 3.8.3.1.1.1-1 and 3.9.1.7.1.1-1.	D	CofC	
					Payload hardware accessibility shall be verified by demonstration. The verification shall be considered successful when the demonstration shows that the specified accessibility is sufficient to remove, replace, operate and maintain integrated Attached Payload equipment.	b) JSC review, inspection and acceptance of AP demonstration summary to assure AP hardware accessibility is sufficient to remove, replace, operate and maintain integrated Attached Payload equipment.			
160	IRD SSP 57003	3.8.3.1.1 4.3.8.3.1.1	A	Body envelope and Reach Accessibility	APs shall provide adequate volume to accommodate crew performance of tasks to ensure that tool utilization is sufficient to remove, replace, operate, and maintain the payload equipment. Adequate volume shall be verified by demonstration.	a) Submittal of analysis summary that demonstrates AP volume accommodates crew performance of tasks including tool utilization is sufficient to remove, replace, operate and maintain the integrated AP equipment.	A	CofC	
					The verification shall be considered successful when the demonstration shows that the specified volume to accommodate crew performance of tasks including tool utilization is sufficient to remove, replace, operate and maintain the integrated Attached Payload equipment.	b) JSC review, inspection and acceptance of analysis to assure volume accommodates crew task performance including tool utilization is sufficient to R&R, operate and maintain the integrated AP equipment.			
161	IRD	3.8.3.1.1.1	A	Centering	AP crew mobility aides or grasp points shall be	a1) Development and submittal of	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
	SSP 57003	4.3.8.3.1.1.1			designed to accommodate the 50th % american female to 95% male anthropometric measurements including:	analysis and drawing inspection summary that demonstrates AP handrail/handhold locations to the left or right of the body centerline shall be verified by analysis that is based upon 50th percentile American female to 95th percentile American male anthropometric measurements. (figures 3.8.1.1.1-1 and 3.8.1.1.3-1).	I? D?		
					A. Crew mobility aides and grasp points shall be placed within 24" to the left or right of the body centerline when working in a for restraint position described in figure 3.8.3.1.1.1-1 Handrail/handhold locations to the left or right of the body centerline shall be verified by analysis.	a2) Development and submittal of analysis and drawing inspection summary that demonstrates AP handrail/handhold provided less than 24" to the left or right of the body centerline when working in a foot restraint position.			
					The analysis shall be based upon 50th percentile American female to 95th percentile American male anthropometric measurements and AP flight drawings. The analysis shall be considered successful when the AP flight drawings show that there is a handrail/handhold provided less than 24 inches to the left or right of the body centerline when working in a foot restraint position.	b1) Development and submittal of analysis and drawing inspection summary that demonstrates AP handrail/handhold locations above or below the center or the crewmembers optimum two-handed work envelope is based upon 50th percentile American female to 95th percentile American male anthropometric measurements.			
					B. Crew mobility aides and grasp points shall be placed within 18" above or below the center of the crewmember's optimum 2 handed work envelope as described in figure 3.8.1.1.3-1. Handrail/handhold locations above or below the center or the crewmembers optimum two-handed work envelope shall be verified by analysis.	b2) Development, and submittal of analysis and drawing inspection summary that demonstrates AP handrail/handhold provided less than 18" above or below the center when working in a foot restraint position.			
					The analysis shall be based upon 50th percentile American female to 95th percentile American male anthropometric measurements and AP flight drawings. The analysis shall be considered successful when the AP flight drawings show that analysis shall be considered successful when the AP flight drawings show that there is a handrail/handhold provided less than 18 inches above or below the center when working in a foot restraint position.	c) JSC review, inspection and acceptance of AP analysis and drawing inspection summary to assure AP handrail/handhold locations provided are less than 24" to the left or right of the body centerline when working in a foot restraint position and less than 18" above or below the center when working in a foot restraint position.			
162	IRD SSP 57003	3.8.3.1.1.2 4.3.8.3.1.1.2	A	EVA Crewmember Field of View	AP equipment, displays, and markings required to be seen to perform EVA tasks shall be	a) Development, and submittal of analysis summary of AP visual task	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					located within the field of view of the EMU as defined in Figure 3.8.3.1.1.2-1. The visual task location requirements shall be verified by analysis. The analysis shall be based upon documentation defining EVA tasks required at AP and flight element drawings.	location requirements at AP and flight element drawings show equipment, controls, displays, and markings are positioned so that a crewmember in an EMU can see them while performing the task in accordance with Figure 3.8.3.1.1.2-1.			
					The analysis shall show that the equipment, controls, displays, and markings are positioned so that a crewmember in an EMU can see them while performing the task. The analysis shall be considered successful when the data shows that the equipment, controls, displays, and markings required to perform EVA tasks are located within the field of view defined in Figure 3.8.3.1.1.2-1.	b) JSC review, inspection and acceptance of AP analysis summary to assure AP visual task location requirements at AP and flight element drawings show equipment, controls, displays, and markings are positioned so that a crewmember in an EMU can see them while performing the task in accordance with Figure 3.8.3.1.1.2-1.			
163	IRD SSP 57003	3.8.3.1.1.2 4.3.8.3.1.1.3	A	External Task Location Requirements	All tasks to be performed by the crewmember wearing a pressurized suit at dedicated worksites as defined by 3.8.1 shall be located per figure 3.8.3.1.1.3-1. All pressurized suit task locations shall be verified by demonstration. Verification shall be considered successful when the demonstration shows that the specified EVA tasks are located per Figure 3.8.3.1.1.3-1.	a) Development, and submittal of demonstration summary that shows pressurized suit task locations for specified EVA tasks are located per Figure 3.8.3.1.1.3-1. b) JSC review, inspection and acceptance of AP demonstration summary to assure pressurized suit task locations for specified EVA tasks are located per Figure 3.8.3.1.1.3-1.AP	D	Data Certification	
164	IRD SSP 57003	3.8.3.2.1 4.3.8.3.2.1	A	External Limit Loads	External Components of attached payload hardware which will have a crew or crew actuated tool interface shall be operable by the loads in Table 3.1.1.2.6-2.	a) Development and submittal of test summary that demonstrates AP external hardware (with crew/crew actuated tool interface) forces required to actuate the hardware in accordance with Table 3.1.1.2.6-2 under the full range of thermal and vacuum conditions expected on-orbit.	T	CofC	
					External hardware with crew or crew actuated tool interface shall be verified by thermal vacuum test. The test shall consist of measuring the forces required to actuate the hardware. The test shall be considered successful when the data shows that the actuation forces for crew or crew actuated tool interfaces are in accordance with Table 3.1.1.2.6-2 under the full range of thermal and vacuum conditions expected on-orbit.	b) JSC review, inspection and acceptance of AP test summary to assure external hardware (with crew/crew actuated tool interface) forces required to actuate the hardware in accordance with Table 3.1.1.2.6-2 under the full range of thermal and vacuum conditions expected on-orbit.			
165	IRD SSP 57003	3.8.3.2.2 4.3.8.3.2.2	A	EVA Actuated Controls	There shall be no EVA actuated controls on APs .	a) Development and submittal of assessment that demonstrates there are	I	CofC	This requirement may require some

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Verification shall be by inspection of Attached Payload drawings. Verification will be successful when it has shown that there are no EVA actuated controls on Attached Payloads.	no EVA actuated controls on AP. b) JSC review, inspection and acceptance of AP assessment to assure there are no EVA actuated controls on AP			clarification?
166	IRD SSP 57003	3.8.3.3 4.3.8.3.3	A	Mobility Aides and Restraints	AP design shall be in accordance with the mobility aides requirements specified in 50005, para. 11.8 Verification shall be by inspection. Inspection of AP drawings shall include mobility aids and restraints. Verification shall be considered successful when the AP is in accordance with the requirements specified in SSP 50005, para. 11.8.	a) Development, and submittal of inspection summary that demonstrates AP drawings include mobility aids/restraints in accordance with the requirements specified in SSP 50005, para. 11.8. b) JSC review, inspection and acceptance of AP inspection summary to assure AP drawings include mobility aids/restraints in accordance with the requirements specified in SSP 50005, para. 11.8.	I	CofC	
167	IRD SSP 57003	4.3.8.3.3.1	A- 57003 NA- 57213	Provide EVA Handles	All removable or portable payload units greater than 1'3" size shall be provided with handles or other suitable means for grasping, tethering, handling, and carrying. Provision of handles on portable payload units shall be verified by inspection of equipment drawings. Verification shall be considered successful when inspection of the portable unit hardware confirms compliance with the requirements.	a) Submittal of inspection summary that demonstrates AP portable payload units handle provisions are verified by inspection of equipment drawings that confirm removable/portable payload units greater than 1 ft3 in size are provided with handles/other means for grasping/tethering/handling, and carrying. b) JSC review, inspection and acceptance of AP inspection summary that confirms AP portable payload units handle provisions with requirements.	I	CofC	No requirements specified
168	IRD SSP 57003	3.8.3.3.1.1 4.3.8.3.3.1.1	A	EVA Handholds/Handrails	A. EVA handhold/handrail design shall be in accordance with the requirements specified in SSP 30256:001, para. 3.6.1. Hand hold/handrail design shall be verified by analysis. The analysis shall be considered successful when the AP flight drawings show that the design is in accordance with SSP 30256:001, paragraph 3.6.1.	a) Development, and submittal of analysis summary that demonstrates AP handhold/handrail design is in accordance with SSP 30256:001, paragraph 3.6.1.	A	CofC	
					B. Handholds shall be oriented such that the plane formed by the handhold longitudinal axis and the cross-section major axis is parallel with the body torso frontal plane. Handrail/handhold orientation shall be verified by analysis. The analysis shall be considered successful when the AP flight drawings show that handrail/handholds are provided in accordance to 3.8.3.3.1.1.	b) Development and submittal of analysis summary that demonstrates AP handrail/handhold orientation is verified to show compliance in accordance with 57003, 3.8.3.3.1.1. c) JSC review, inspection and acceptance of AP analysis summary to assure AP handhold/handrail design is in accordance with SSP 30256:001,			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						paragraph 3.6.1 and orientation is verified to show compliance in accordance with 57003, 3.8.3.3.1.1.			
169	IRD SSP 57003	3.8.3.3.1.2 4.3.8.3.3.1.2	A	Dimensions	EVA handhold and handrail dimensions shall conform to Figure 3.8.3.3.1.2-1.. EVA handle dimensions for moveable or portable units shall be verified by analysis or demonstration.	a) Development, and submittal of analysis/demonstration summary that demonstrates AP EVA handle dimensions for moveable/portable units are compliant with the requirements in 3.8.3.3.1.2.	A or D	CofC	
					The verification shall be considered successful when demonstration of the flight hardware confirms compliance with the requirements in 3.8.3.3.1.2.	b) JSC review, inspection and acceptance of AP analysis/demonstration summary to assure AP EVA handle dimensions for moveable/portable units are compliant with the requirements in 3.8.3.3.1.2.			
170	IRD SSP 57003	3.8.3.3.1.3 4.3.8.3.3.1.3	A	Mounted Clearance	A. The minimum clearance distance between the low surface of the handrail/handhold and the mounting surface shall be 2.25" (5.7 cm) . EVA clearances between the low surface of the handrail/handhold and the mounting surface shall be verified by analysis or demonstration. The verification shall be considered successful when the analysis or demonstration of the flight hardware confirms compliance with the requirements in 3.8.3.3.1.3 A.	a) Development, and submittal of analysis/demonstration summary that show AP EVA clearances between the low surface of the handrail/handhold and the mounting surface are in compliance with the requirements in 3.8.3.3.1.3 A. (at least 2.25" (5.7 cm))	A or D	CofC	
					B. Handle and grasp areas shall be located so that they do not interfere with equipment location or maintenance . An analysis or demonstration of the flight hardware shall be performed to verify this requirement. The verification shall be considered successful when the analysis or demonstration confirms compliance with the requirement specified in 3.8.3.3.1.3 B.	b) Development, and submittal of analysis/demonstration summary that show AP compliance with the requirement specified in 3.8.3.3.1.3 B.			
					C. EVA clearances shall be provided between handles and obstructions consistent with gloved hand sizes as given in Figure 3.8.3.4.1-1. EVA clearances consistent with gloved hand sizes shall be verified by analysis or demonstration. The verification shall be considered successful when the analysis or demonstration of the flight hardware confirms compliance with the requirements in 3.8.3.3.1.3 C.	c) Development, and submittal of analysis/demonstration summary that show AP EVA clearances consistent with gloved hand sizes confirms compliance with the requirements in 3.8.3.3.1.3 C. (handle and grasp areas are located so that they do not interfere with equipment location or maintenance)			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						d) JSC review, inspection and acceptance of AP analysis/demonstration summary to assure AP EVA clearances between the low surface of the handrail/handhold and the mounting surface, EVA clearances with gloved hand sizes are in compliance with IRD SSP 57003 para. 3.8.3.3.1.3 A, 3.8.3.3.1.3 B, 3.8.3.3.1.3 C, Figure 3.8.3.4.1-1			
171	IRD SSP 57003	3.8.3.3.1.4 4.3.8.3.3.1.4	A		A. Translation and mobility handholds shall be positioned such that the crew-operated equipment is accessible and not obstructed visibly or physically by the handholds. An analysis or demonstration of the flight hardware shall be performed to verify this requirement. The verification shall be considered successful when the analysis or demonstration confirms compliance with the requirement specified in 3.8.3.3.1.4 A.	a) Development and submittal of AP analysis/demonstration summary confirms compliance with the requirement specified in 3.8.3.3.1.4 A.	A or D	CofC	
					B. Handles and grasp areas shall be placed on the accessible surface of a payload item consistent with the removal direction. An analysis or demonstration of the flight hardware shall be performed to verify this requirement. The verification shall be considered successful when the analysis or demonstration confirms that the handles and grasp areas are placed on the accessible surface of an item consistent with the removal direction in compliance with the requirement specified in 3.8.3.3.1.4 B.	b) Development and submittal of AP analysis/demonstration summary confirms handles and grasp areas are placed on the accessible surface of an item consistent with the removal direction in compliance with requirement specified in 3.8.3.3.1.4 B.			
					C. Mobility handholds located within 3' of attached payload or ISS equipment which poses a critical or catastrophic hazard to the crewmember or the equipment shall be identified and color coded. An analysis or demonstration of the flight hardware shall be performed to verify this requirement. The verification shall be considered successful when the analysis or demonstration confirms compliance with the requirement specified in 3.8.3.3.1.4 C.	c) Development and submittal of AP analysis/demonstration summary confirms compliance with the requirement specified in 3.8.3.3.1.4 C.			
						d) JSC review, inspection and acceptance of AP analysis/demonstration summary to assure compliance with the requirements specified in IRD SSP			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						57003 3.8.3.3.1.4 A, 3.8.3.3.1.4, and 3.8.3.3.1.4 C. to show handles and grasp areas are placed on the accessible surface of an item consistent with the removal direction.			
172	IRD SSP 57003	3.8.3.3.1.5 4.3.8.3.3.1.5	A	Non-Fixed Handles Design	A.Non-fixed handles shall have a stop position for holding the handle perpendicular to the surface on which it is mounted. An analysis or demonstration of the flight hardware shall be performed to verify this requirement. The verification shall be considered successful when the analysis or demonstration confirms that the stop position for holding the handle perpendicular to the surface on which it is mounted is in compliance with the requirement specified in 3.8.3.3.1.5 A.	a) Development, and submittal of analysis/demonstration summary to confirms that the stop position for holding the handle perpendicular to the surface on which it is mounted is in compliance with the requirement specified in 3.8.3.3.1.5 A.	A or D	CofC	
					B. Nonfixed handles shall be capable of being placed in the use position by one hand and shall be capable of being removed or stowed by one hand. An analysis or demonstration of the flight hardware shall be performed to verify this requirement. The verification shall be considered successful when the analysis or demonstration confirms that the flight hardware is in compliance with the requirement specified in 3.8.3.3.1.5 B.	b) Development, and submittal of analysis/demonstration summary of AP flight hardware to verify flight hardware is in compliance with the requirement specified in 3.8.3.3.1.5 B.			
					C. Attachable/removable handles shall incorporate tactile and/or visual indication of locked/unlocked status. An analysis or demonstration of the flight hardware shall be performed to verify this requirement. .	c) Development, and submittal of analysis/demonstration summary to confirms that handles incorporate tactile and/or visual indication of locked/unlocked status in compliance with the requirement specified in 3.8.3.3.1.5 C.			
					The verification shall be considered successful when the analysis or demonstration confirms that the handles incorporate tactile and/or visual indication of locked/unlocked status in compliance with the requirement specified in 3.8.3.3.1.5 C	d) JSC review, inspection and acceptance of AP analysis/demonstration summary of AP flight hardware in accordance with SS[ 57003, paras. 3.8.3.3.1.5 A, 3.8.3.3.1.5 B, and 3.8.3.3.1.5 C to assure handles incorporate tactile and/or visual indication of locked/unlocked status and stop position for holding the handle perpendicular to the surface.			
173	IRD SSP 57003	3.8.3.3.1.6 4.3.8.3.3.1.6	A	Handrail/Handhold Tether Attachment	EVA handrails/handholds shall accommodate safety tether hooks.	a) Development and submittal of inspection summary that demonstrates	A	CofC	No requirements specified

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					An inspection of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the inspection shows that EVA handrails/handholds accommodate safety tether hooks as specified.	AP hardware and flight drawings show EVA handrails/handholds accommodate safety tether hooks as specified.			
						b) JSC review, inspection and acceptance of AP inspection summary to assure AP hardware and flight drawings show EVA handrails/handholds accommodate safety tether hooks as specified.			
174	IRD SSP 57003	3.8.3.1.1.7 4.3.8.3.1.1.7	A	Danger Warnings	An inspection of Attached Payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the inspections shows that translation and mobility handholds located within three ft. of payload equipment which poses a critical or catastrophic hazard to the crewmember or to the equipment, are identified and color coded.	a) Submittal of inspection/ analysis summary that demonstrates AP hardware and flight drawings translation/mobility handholds are located within 3't. of equipment which poses a critical or catastrophic hazard to the crewmember or to the equipment, are identified and color coded and EVA backup provisions provided in accordance with SSP 50005, paragraph 12.3.	I&A	732 Approval and Drawing Review.	
					An analysis of AP flight drawings shall be used to verify that manual EVA backup provisions have been provided in accordance with SSP 50005, paragraph 12.3.	b) JSC review, inspection and acceptance of AP inspection/analysis summary to assure AP hardware and flight drawings show translation/mobility handholds located within three ft. of payload equipment which poses a critical or catastrophic hazard to the crewmember or to the equipment, are identified and color coded and EVA backup provisions provided in accordance with SSP 50005, paragraph 12.3.			
175	IRD SSP 57003	3.8.3.3.1.8 4.3.8.3.3.1.8	A	Color	Translation and mobility handholds located within 3' of the payload equipment which poses a critical or catastrophic hazard to the crewmember or to the equipment shall be identified and color coded in accordance with EVA labeling requirements of SSP 50005.	a) Development and submittal of inspection summary that demonstrates AP hardware and flight drawings show all EVA handrails/handholds and safety tether points are yellow.	I	CofC	
					EVA handrail/handholds and safety tether points shall be in yellow anodized. An inspection of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be	b) JSC review, inspection and acceptance of AP inspection summary to assure AP hardware and flight drawings show all EVA handrails/handholds and safety tether			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					considered successful when the inspection shows all EVA handrails/handholds and safety tether points are yellow.	points are yellow.			
176	IRD SSP 57003	3.8.3.3.2 4.3.8.3.3.2	A	EVA Safety Tethers and Safety Hooks	Crew safety tether points shall be provided along all routes and at worksites An inspection of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the inspection shows that crew safety tether points have been provided along all routes and at all worksites.	a) Development and submittal of inspection summary of AP hardware and flight drawings to show crew safety tether points have been provided along all routes and at all worksites. b) JSC review, inspection and acceptance of AP inspection summary of AP hardware and flight drawings to assure crew safety tether points have been provided along all routes and at all worksites.	I	CofC	
177	IRD SSP 57003	3.3.8.3.2.1 4.3.3.8.3.3.2.1	A - 57003 NA - 57213	Tether Attach Points	A. All equipment items shall be provided a standardized tether hook receptacle shown in figure 3.8.3.3.1.2-1 An inspection of Attached Payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the inspection shows that crew safety tether points have been provided in accordance with 3.8.3.3.2.1.	a) Development, and submittal of inspection summary that demonstrates AP hardware and flight drawings show crew safety tether points have been provided in accordance with 3.8.3.3.2.1.	I	CofC	
					B. The standardize tether hook receptacle shall also be provided on the interfacing surface to which the item is to be secured. An inspection of AP hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the inspection shows that crew safety tether points have been provided on the interfacing surface which the item is to be secured in accordance with 3.8.3.3.2.1.	b) Development, and submittal of inspection summary that demonstrates AP hardware and flight drawings show crew safety tether points have been provided on the interfacing surface which the item is to be secured in accordance with 3.8.3.3.2.1.			
					C. The EVA handrail/hold tether point shall be designed as shown in Figure 3.8.3.2.1-1. An inspection of AP hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the inspection shows that crew safety tether points have been designed in accordance with 3.8.3.3.2.1.	c) Development, and submittal of inspection summary that demonstrates AP hardware and flight drawings show crew safety tether points have been designed in accordance with 3.8.3.3.2.1. d) Development, and submittal of inspection summary that demonstrates AP hardware and flight drawings show translation /mobility handholds located within 3' of the payload equipment which poses a critical or catastrophic hazard to the crewmember or to the			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						equipment are identified and color coded in accordance with EVA labeling requirements of SSP 50005			
						e) JSC review, inspection and acceptance of AP inspection summary that demonstrates AP hardware and flight drawings show crew safety tether points have been designed in accordance with 3.8.3.3.2.1.			
178	IRD SSP 57003	3.8.4.1 4.3.8.3.4.1	A	EVA Gloved Hand Access	AP equipment and structures requiring EVA interfaces shall be designed to maintain a minimum clearance envelope of 8 " (20 cm) high by 10.5" (27 cm) wide with a maximum depth of 18" (46cm) for gloved access as shown in Figure 3.8.3.4.1-1.	a) Development, and submittal of analysis and demonstration summary to verify gloved hand operations clearance requiring EVA interfaces are be designed to maintain a minimum clearance envelope of 8 " high X 10.5" wide X 18" deep for gloved access as shown in Figure 3.8.3.4.1-1. with Figure 3.8.3.4.1-1.	A or D	CofC	
					Verification shall be by analysis or demonstration of design. Equipment drawings for items that require gloved hand operations shall be analyzed to verify clearance in accordance with Figure 3.8.3.4.1-1.	b) JSC review, inspection and acceptance of AP analysis and demonstration summary to assure gloved hand operations clearance in accordance with Figure 3.8.3.4.1-1.			
					Verification shall be considered successful when dimensional analysis or demonstration of the design shows compliance with the specified requirement.				
179	IRD SSP 57003	3.8.3.5 4.3.8.3.5	A	Location Coding	The AP shall have a single consistent alphanumeric operational coding standard for designating locations across the entire ISS in accordance with SSP 30575, para.4.1.	a) Development and submittal of analysis that demonstrates AP location coding scheme is a single, consistent alphanumeric operational coding standard for designating locations across the module in accordance with SSP 30575, para.4.1.	A 732 Approval Drawing Review		
					The AP location coding scheme shall be analyzed to verify that it is a single, consistent alphanumeric operational coding standard for designating locations across the module in accordance with SSP 30575. The verification shall be considered successful when it is shown that there is a single, consistent operational coding standard in accordance with SSP 30575.	b) JSC review, inspection and acceptance of AP analysis summary to assure location coding scheme is a single, consistent alphanumeric operational coding standard for designating locations across the module in accordance with SSP 30575.			
180	IRD SSP 57003	3.8.4.1.1 4.3.8.4.1.1	A	Incidental Contact	For incidental contact, temperatures shall be maintained within -180 to +235 F or limit heat transfer rates as specified in Table 3.8.4.1.1-1.	a1) Development and submittal of analysis summary that demonstrates AP data from drawings, thermal	A T?	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					An analysis shall be performed using data from drawings, thermal analyses, tests, and operational procedures to identify hardware whose temperature exceed – 180 degrees F to +235 degrees F and have potential for incidental contact by EVA crewmembers. The analysis shall determine contact surface temperatures and average heat transfer rates at EVA interfaces.	analyses, tests, and operational procedures identify hardware whose temperature exceed – 180 degrees F to +235 degrees F and have potential for incidental contact by EVA crewmembers.			
						a2) Development and submittal of thermal test summary that identify hardware whose temperature exceed – 180 degrees F to +235 degrees F and have potential for incidental contact by EVA crewmembers. a3) Development and submittal of operational procedures summary identify hardware whose temperature exceed – 180 degrees F to +235 degrees F and have potential for incidental contact by EVA crewmembers.			
					The contact node, an adiabatic surface except for contact with the boundary node, shall have a surface area of 42.75 in squared and shall have a non-zero thermal capacitance value. Analysis shall show that heat transfer rates do not exceed rates specified in Table 3.8.4.1.1–1. Verification shall be considered successful when the analysis shows that equipment temperatures and heat rates shall not pose a hazard to the suited EVA crewmember.	a4) Submittal of thermal analysis summary that identify hardware whose temperature exceed – 180 degrees F to +235 degrees F and have potential for incidental contact by EVA crewmembers.			
						a5) Development and submittal of analysis summary that demonstrates AP contact surface temperatures and average heat transfer rates at EVA interfaces with the appropriate temperature listed in IRD SSP 57003, Table 3.8.4.1.1–1 is connected with linear conductor to a 42.75 in squared surface of the objects exposed area overlaying the contact node.			
						The contact node, an adiabatic surface except for contact with the boundary node, shall have a surface area of 42.75 in squared and shall have a non-zero thermal capacitance value.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						a6) Analysis summary that demonstrates AP heat transfer rates do not exceed rates specified in Table 3.8.4.1.1-1 and heat rates shall not pose a hazard to the suited EVA crewmember. b) JSC review, inspection and acceptance of AP analysis, test and operations summary to assure AP does not pose a hazard of incidental contact by EVA crewmembers.			
181	IRD SSP 57003	3.8.4.1.2 4.3.8.4.1.2	A	Unlimited Contact	For unlimited contact, temperatures shall be maintained within -45 to +145 F for designated EVA crew interfaces specified in table 3.8.4.1.2-1, limit heat transfer rates as specified in table 3.8.4.1.1-1. An analysis shall be performed using data from drawings, thermal analyses, tests, and operational procedures to identify hardware whose temperature exceed -45 degrees F to + 145 degrees F for potential unlimited contact by EVA crewmembers.	a1) Development and submittal of analysis summary that demonstrates AP An analysis shall be performed using data from drawings to verify temperature do not exceed -45 degrees F to + 145 degrees F for potential unlimited contact by EVA crewmembers.	A&I	CofC	
						a2) Development and submittal of test summary that demonstrates AP temperatures do not exceed -45 degrees F to + 145 degrees F for potential unlimited contact by EVA crewmembers and limit heat transfer in accordance with tables 3.8.4.1.2-1 and 3.8.4.1.1-1.			
					The analysis shall determine contact surface temperatures and average heat transfer rates at EVA interfaces. For the purposes of this analysis, a boundary node with the appropriate temperature listed in Table 3.8.4.1.2-1 is connected with linear conductor to a 42.75 inches squared surface of the objects exposed area overlaying the contact node.	a3) Development and submittal of AP operational procedures to identify hardware whose temperature exceed - 45 degrees F to + 145 degrees F for potential unlimited contact by EVA crewmembers are included as warning in FDF products.			
					The contact node, an adiabatic surface except for contact with the boundary node, shall have a surface area of 42.75 inches squared and shall have a non-zero thermal capacitance value.	a4) Development and submittal of analysis summary that demonstrates AP a boundary node with the appropriate temperature listed in Table 3.8.4.1.2-1 is connected with linear conductor to a 42.75 inches squared surface of the objects exposed area overlaying the contact node.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						a5) The contact node, an adiabatic surface except for contact with the boundary node, shall have a surface area of 42.75 inches squared and shall have a non-zero thermal capacitance value heat transfer rates do not exceed rates specified in Table 3.8.4.1.2-1.			
					Analysis shall show that heat transfer rates do not exceed rates specified in Table 3.8.4.1.2-1. Verification shall be considered successful when the analysis shows that equipment temperatures and heat rates shall not pose a hazard to the suited EVA crewmember.	b) JSC review, inspection and acceptance of AP analysis, test, and operational controls to assure unlimited contact does not pose a hazard to the suited EVA crewmember.			
182	IRD SSP 57003	3.8.4.2 4.3.8.4.2	A - 57003 NA - 57213	Equipment Clearance for Entrapment Hazards	Clearance shall be provided for equipment removal and replacement to prevent the creation of a crew entrapment hazard.	a) Development and submittal of analysis and demonstration summary to show data from drawings, operational procedures, and integration documentation for equipment/hardware that may require removal or replacement or both and the planned	A&I	CofC	
					AP equipment and structures along translation routes, worksite provisions, and each equipment item requiring an EVA interface shall protect the crew from injury due to sharp edges by the use of corner and edge guards or by rounding corners and edges in accordance with NSTS 07700, Vol XIV, Appendix 7, Para. 2.3.	stowage associated with maintenance operations have stowage capacity and locations used in the maintenance are sufficient to prevent the creation of a crew entrapment hazard and assure AP clearances are provided for equipment removal and replacement.			
					Verification shall be by analysis and demonstration. An analysis shall be performed using data from drawings, operational procedures, and integration documentation to identify equipment/hardware that may require removal or replacement or both and the planned stowage associated with maintenance operations.	b) JSC review, inspection and acceptance of AP to assure maintenance activities do not obstructs crewmember translation or creates an entrapment area.			
					Demonstrations shall show that stowage capacity and locations for equipment/hardware used in the maintenance procedures are sufficient to prevent the creation of a crew entrapment hazard. Verification shall be considered successful when demonstrations show that maintenance activities will not require stowage of material in a manner that obstructs crewmember translation or creates an entrapment area.				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
183	IRD SSP 57003	3.8.2.1.1.1 4.3.8.4.2.1.1	A	Sharp Edges	Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify hardware edges and corners requiring rounding, the use of guards, or covers due to location in crewmember translation paths and maintenance worksites.	a1,a2,a3,a4) Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation and operational procedures notes to verify exposed edges requiring rounding are in accordance with figure 3.8.4.2.1.1.1-1/2/3/4. (0.25 in. (6.4 mm) thick - use 3.8.4.2.1.1.1 A, 0.12 to 0.25 in. (3.0 to 6.4 mm) thick - use 3.8.4.2.1.1.1 B, 0.02 to 0.12 in. (0.5 to 3.0 mm use 3.8.4.2.1.1.1 C, and rolling and curling of 0.02 in. (0.5 mm) thick or less - use 3.8.4.2.1.1.1D.	A&I	CofC	
						a5) Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation, and operational procedures identify edges/corners requiring rounding, the use of guards, or covers due to location in crewmember translation paths and maintenance worksites.			
					A drawing inspection shall show that the required edge and corner rounding, deburring, or cover installation has been accomplished or proper guards are in place.	a6) Design review, analysis, and operational assessment to assure attached payload equipment/structures along translation routes, worksite provisions, and each equipment item requiring an EVA interface shall protect the crew fro injury due to sharp edges in accordance with NSTS 07700, Vol XIV, Appendix 7, Para. 2.3 .			
					Verification shall be considered successful when inspection of the hardware shows that all required edges or corners have been properly machined, covered, or guarded.	a7) Development, and submittal of analysis and inspection summary that demonstrates AP edge/corner rounding, deburring, or cover installation is accomplished or proper guards are in place.			
					The verification shall be successful when the demonstration verifies that the exposed corners and edges do not pose a hazard to the EVA crew.	b) JSC review, inspection and acceptance of AP analysis and summary to assure AP hardware shows that all required edges or corners have been properly machined, covered, or guarded to verify that the exposed corners and edges do not pose a hazard			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						to the EVA crew.			
184	IRD SSP 57003	3.8.2.1.1.1 4.3.8.2.1.1.1	A	Exposed Edge Requirements	A. 0.25 " (6.4cm) thick or greater shall be rounded to a minimum radius of 0.12"(3 mm) per figure 3.8.4.2.1.1.1-1. Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation and operational procedures notes to identify exposed edges requiring rounding.	a1,a2,a3,a4) Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation and operational procedures notes to verify exposed edges requiring rounding are in accordance with figure 3.8.4.2.1.1.1-1/2/3/4. (0.25 in. (6.4 mm) thick - use 3.8.4.2.1.1.1 A, 0.12 to 0.25 in. (3.0 to 6.4 mm) thick - use 3.8.4.2.1.1.1 B, 0.02 to 0.12 in. (0.5 to 3.0 mm use 3.8.4.2.1.1.1 C, and rolling and curling of 0.02 in. (0.5 mm) thick or less - use 3.8.4.2.1.1.1D.a1)	A&I	CofC	
					A drawing inspection shall show that the design drawing notes for rounding exposed edges of 0.25 in. (6.4 mm) thick or greater are in accordance with specified requirements. Verification shall be considered successful when the inspection of the hardware shows that the hardware meets the specified requirement in 3.8.4.2.1.1.1 A.	<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>			
					B .012-0.25" (3-6.6 cm) thick or greater shall be rounded to a minimum radius of 0.06"(1.5mm) per figure 3.8.4.2.1.1.1-2. Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation and operational procedures notes to identify exposed edges requiring rounding.	Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation, and operational procedures identify edges/corners requiring rounding, the use of guards, or covers due to location in crewmember translation paths and maintenance worksites.			<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>
					A drawing inspection shall show that the design drawing notes for rounding exposed edges of 0.12 to 0.25 in. (3.0 to 6.4 mm) thick are in accordance with specified requirements. Verification shall be considered successful when the inspection of the hardware shows that the hardware meets the specified requirement in 3.8.4.2.1.1.1 B.				
					C. 0.02-0.12" (0.5 -3cm) thick or greater shall be rounded to a full radius per figure 3.8.4.2.1.1.1-3.Verification shall be analysis and inspection. An analysis shall be performed using data from drawings, integration	a5) Design review, analysis, and operational assessment to assure attached payload equipment/structures along translation routes, worksite provisions, and each equipment item			<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					documentation and operational procedures notes to identify exposed edges requiring rounding.	requiring an EVA interface shall protect the crew fro injury due to sharp edges in accordance with NSTS 07700, Vol XIV, Appendix 7, Para. 2.3 .			
					A drawing inspection shall show that the design drawing notes for rounding exposed edges of 0.02 to 0.12 in. (0.5 to 3.0 mm) thick are in accordance with specified requirements. Verification shall be considered successful when the inspection of the hardware shows that the hardware meets the specified requirement in 3.8.4.2.1.1.1 C.	a6) Development, and submittal of analysis and inspection summary that demonstrates AP edge/corner rounding, deburring, or cover installation is accomplished or proper guards are in place.			<b>Manufacturing documentation in ADP showing sucessful performance of sharp edge inspection by JSC</b>
					D. The edges of thin sheets less than 0.02" (0.5 mm) thick shall be rolled and curled per figure 3.8.4.2.1.1.1-4. Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation and operational procedures notes to identify exposed edges requiring rolling and curling.	b) JSC review, inspection and acceptance of AP analysis and inspection summaries to assure exposed edges requiring rounding, rolling or curling are in accordance with IRD SSP 57003, paras. 3.8.4.2.1.1.1 A/B/C/D..			<b>Manufacturing documentation in ADP showing sucessful performance of sharp edge inspection by JSC</b>
					A drawing inspection shall show that the design drawing notes for rolling and curling exposed edges of 0.02 in. (0.5 mm) thick or less are in accordance with specified requirements. Verification shall be considered successful when the inspection of the hardware shows that the hardware meets the specified requirement in 3.8.4.2.1.1.1D.				<b>Manufacturing documentation in ADP showing sucessful performance of sharp edge inspection by JSC</b>
185	IRD SSP 57003	3.8.2.1.1.2 4.3.8.4.2.1.1.2	A	Exposed Corner Requirements	A. Exposed corners of materials less than 1.0" thick (25mm) shall be rounded to a minimum radius of 0.5 "(13mm). (see figure 3.8.4.2.1.1.2-1. Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation and operational procedures notes to identify exposed corners requiring rounding.	a1) Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation and operational procedures notes to verify exposed edges requiring rounding with 1.0" (25 mm) thick or greater are in accordance with specified requirements in accordance with 3.8.4.2.1.1.2A.	A&I	CofC	<b>Manufacturing documentation in ADP showing sucessful performance of sharp edge inspection by JSC</b>
					A drawing inspection shall show that the design drawing notes for rounding exposed corners of less than 1.0 in. (25 mm) thick are in accordance with specified requirements. Verification shall be considered successful when the inspection of the hardware shows that the hardware meets the specified requirement in 3.8.4.2.1.1.2 A.	a2) Design review, analysis, and operational assessment to assure attached payload exposed corners are rounded to a minimum radius of 0.5" (13mm) in accordance with figures 3.8.4.2.1.1.2-1/2.			<b>Manufacturing documentation in ADP showing sucessful performance of sharp edge inspection by JSC</b>

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Exposed corners of materials that exceed 1.0" thick (25mm) shall be rounded to a minimum radius of 0.5 "(13mm). (see figure 3.8.4.2.1.1.2-2). Verification shall be by analysis and inspection.	b) Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation and operational procedures notes to verify exposed edges requiring rounding greater than 1" (25mm) thick or greater are in accordance with specified requirements in accordance with 3.8.4.2.1.1.2B			
					An analysis shall be performed using data from drawings, integration documentation and operational procedures notes to identify exposed corners requiring rounding.	c) JSC review, inspection and acceptance of AP analysis and inspection summaries to assure exposed edges requiring rounding are in accordance with IRD SSP 57003, paras. 3.8.4.2.1.1.2A/B			<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>
					A drawing inspection shall show that the design drawing notes for rounding exposed corners of greater than 1.0 in. (25 mm) thick are in accordance with specified requirements. Verification shall be considered successful when the inspection of the hardware show that the hardware meets the specified requirement in 3.8.4.2.1.1.2 B.				<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>
186	IRD SSP 57003	3.8.4.2.1.2 4.3.8.4.2.1.2	A	Thin Materials	Materials less than 0.08" thick with exposed edges that are uniformly spaced, not to exceed 0.5" gaps, flush at the exposed surface plane and shielded from direct EVA interaction shall have an edge radii greater than 0.003" Verification shall be by analysis and inspection.	a) Development and submittal of analysis that demonstrates AP using data from drawings, integration documentation, and operational procedures to verify hardware material less than an 0.08 inches thick are properly machined with edge radii greater than 0.003" with exposed edges that are uniformly spaced, not to exceed 0.5" gaps, flush at the exposed surface plane and shielded from direct EVA interaction.	A&I	CofC	<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>
						a2) Development, and submittal of inspection summary that demonstrates AP edge radii is accomplished or proper guards are in place and all required edges have been properly machined.			<b>Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC</b>
					An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify hardware	b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure AP data			<b>Manufacturing documentation in ADP showing successful</b>

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					material less than an 0.08 inches thick.	from drawings, integration documentation, and operational procedures verify hardware material less than an 0.08 inches thick are properly machined.			performance of sharp edge inspection by JSC
					A drawing inspection shall show that the required edge radii has been accomplished or proper guards are in place. Verification shall be considered successful when inspection of the hardware shows that all required edges have been properly machined.				Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC
187	IRD SSP 57003	3.8.4.2.2 4.3.8.4.2.2	A	Burrs	Exposed surfaces shall be smooth and free of burrs. Verification shall be by analysis and inspection.	a) Development and submittal of analysis and inspection summary that demonstrates AP drawing data, integration documentation, and operational procedures verify potential areas of burrs and use of procedures to deburr surfaces due to location in crewmember translation paths and maintenance worksites.	A&I	CofC	Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC
					An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify all potential areas of burrs and the required use of procedures to identify and deburr surfaces due to location in crewmember translation paths and maintenance worksites. A drawing inspection shall show that deburring is required. Verification shall be considered successful when analysis and inspection shows that all edges have been properly deburred.	b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure all edges have been properly deburred.			Manufacturing documentation in ADP showing successful performance of sharp edge inspection by JSC
188	IRD SSP 57003	3.8.4.2.3 4.3.8.4.2.3	A	Holes	Holes that are rounded and slotted in the range of 0.4 to 1" (10-25mm) shall be covered. Holes (round/slotted/polygonal) in EVA translation handrails/holds shall be 1" or greater in diameter Verification shall be by inspection.	a) Development, and submittal of inspection summary that demonstrates AP holes (round or slotted) 0.4 to 1.0 inches are covered. Verification shall be considered successful when inspection shows that holes in the range of 0.4 to 1.0 inches are covered.	I	CofC	
					A drawing inspection shall assure that holes (round or slotted) 0.4 to 1.0 inches are covered. Verification shall be considered successful when inspection shows that holes in the range of 0.4 to 1.0 inches are covered.	b) JSC review, inspection and acceptance of AP inspection summary to assure holes in the range of 0.4 to 1.0 inches are covered.			
189	IRD SSP 57003	3.8.4.3.2.1 4.3.8.4.3.2.1	A	Handrail/Holds	Holes that are rounded and slotted in the range of 0.4 to 1" (10-25mm) shall be covered.	a) Development and submittal of inspection summary that demonstrates	I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Holes (round/slotted/polygonal) in EVA translation handrails/holds shall be 1" or greater in diameter. Verification shall be by inspection.	AP holes (round, slotted, polygonal) in EVA translation handrails/holds are 1.0 inches in diameter.			
					A drawing inspection shall assure that holes (round, slotted, polygonal) in EVA translation handrails/holds are 1.0 inches in diameter. Verification shall be considered successful when inspection shows that holes in EVA translation handrails/holds are 1.0 inches or greater in diameter.	b) JSC review, inspection and acceptance of AP inspection summary to assure holes in EVA translation handrails/holds are 1.0 inches or greater in diameter.			
190	IRD SSP 57003	3.8.4.2.4 4.3.8.4.2.4	A	Pinch Points	External EVA actuated equipment which pivots, retracts, or flexes such that a gap greater than 0.5" but less than 1.4" exists between the equipment, in its deployed configuration, and adjacent structure shall be designed to prevent entrapment of EVA crewmember appendages.	a) Submittal of analysis and inspection summary using data from drawings, integration documentation, and operational procedures to verify hardware pinch points and required guards/covers due to location	A&I	CofC	
					Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify hardware pinch points and the required use of guards or covers due to location in crewmember translation paths and maintenance worksites.	in crewmember translation paths and maintenance worksites are in place for EVA actuated equipment which pivots, retracts, or flexes such that a gap greater than 0.5" but less than 1.4" exists between the equipment, in its deployed configuration, and adjacent structure.			
					A drawing inspection shall show that the required cover installation has been accomplished or proper guards are in place. Verification shall be considered successful when the analysis and inspection show that all potential pinch points have been properly covered, or guarded.	b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure all potential pinch points have been properly covered, or guarded.			
191	IRD SSP 57003	3.8.4.2.5 4.3.8.4.2.5	A - 57003 NA - 57213	Protective Covers for Portable Equipment	Portable equipment which does not meet the corner and edge requirements shall be covered or shielded when not in use. Verification shall be by analysis and inspection. An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify the required use of guards or protective covers for portable equipment.	a1) Development, and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation, and operational procedures to verify use of guards or protective covers for portable equipment. a2) Design review, analysis, and operational assessment to assure attached payload portable equipment meets 3.8.4.2.1.1 and 3.8.4.2.1.1.2	A&I	CofC	
					A drawing inspection shall show that the required cover installation has been accomplished or proper guards are in place.	a3) Design review, and operational controls assure attached payload portable equipment which does not			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					verification shall be considered successful when analysis and inspection shows that all necessary items have been properly covered or guarded.	meet the corner and edge requirements are covered or shielded when not in use.			
						b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure all necessary items have been properly covered or guarded.			
192	IRD SSP 57003	3.8.4.2.6.1 4.3.8.4.2.6.1	A	Latches - Design	A. Latches or similar devices shall be designed to prevent entrapment of the crew member appendages. Verification shall be by analysis of design. The analysis shall verify that latching devices are designed in a manner to preclude the entrapment of appendages. Verification shall be considered successful when the analysis shows that the AP meets the specified requirement.	a&b) Development, and submittal of analysis summary that demonstrates AP latching devices are designed to preclude entrapment of appendages that pivot, retract, or flex so that a gap of less than 1.4" (35mm) and latching devices are covered to remove gaps/overhangs that catch fabrics/pressure suit appendages.	A	CofC	
					B. Latches that pivot, retract, or flew so that a gap of less than 1.4" (35mm) exists shall be designed to prevent entrapment of the crewmembers appendage. Verification shall be by analysis of design.				
					The analysis shall verify that latching devices are covered in a manner that does not allow gaps or overhangs that can catch fabrics or pressure suit appendages, or are designed in a manner to preclude the catching of fabrics and pressure suit appendages. Verification shall be considered successful when the analysis shows that the Attached Payload meets the specified requirement.				
					C. Overcenter latches shall include a provision to prevent undesired latch element realignment, interference, or reengagement. Verification shall be by analysis of design.	c) Design review, analysis, and operational assessment to assure AP overcenter latches include provisions to prevent undesired latch element realignment, interference, or reengagement			
					The analysis shall verify that over center latching devices are designed in a manner to preclude the undesirable latch element realignment, interference or reengagement. Verification shall be considered successful when the analysis shows that the Attached				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Payload meets the specified requirement.				
					D. Latch catches shall have locking features. Verification shall be by analysis of design. The analysis shall verify that latching devices are designed to provide locking features. Verification shall be considered successful when the analysis shows that the Attached Payload meets the specified requirement.	d) Design review, analysis, and operational assessment to assure AP latching devices provide locking features.			
					E. If the latch has a handle and latch release shall be operable by one hand. Verification shall be by analysis of design. The analysis shall verify that latching devices with a handle are designed in a manner to be operable by one hand. Verification shall be considered successful when the analysis shows that the Attached Payload meets the specified requirement.	e) Development, and submittal of analysis summary that demonstrates AP latching devices with a handle are designed to operable by one hand.			
						f) JSC review, inspection and acceptance of AP over center and other latching devices to assume elimination of entrapment of appendages, covers to remove gaps/ overhangs that catch fabrics and pressure suit appendages, restriction for undesirable latch element realignment, interference or reengagement, incorporation of locking features, and operable by one hand.			
193	IRD SSP 57003	3.8.4.2.6.2 4.3.8.4.2.6.2	A	Protective Covers or Guards	Latches or similar devices in the proximity of the crewmember translation paths and maintenance worksites shall utilize a protective guard or cover to protect against a snag or inadvertent opening by a crewmember. Verification shall be by analysis and inspection.	a) Development, and submittal of analysis and inspection summary to demonstrate data from drawings, integration documentation, and operational procedures verify latches/guards-covers for crewmember translation paths and maintenance worksites are in place.	A&I	CofC	
					An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify latches and similar devices and the required use of guards or covers due to location in crewmember translation paths and maintenance worksites. guarded.	b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure all latches and similar devices have been properly covered, or guarded.			
					A drawing inspection shall show that the required cover installation has been accomplished or proper guards are in place.				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Verification shall be considered successful when analysis and inspection shows that all latches and similar devices have been properly covered, or				
194	IRD SSP 57003	3.8.4.2.7 4.3.8.4.2.7	A	Captive Parts	Payloads and payload equipment shall be designed in such a manner to ensure that all unrestrained parts (e.g. knobs, handles, lens covers, access plates, or similar devices) that may be temporarily removed on orbit will be tethered or otherwise held captive.	a) Development and submittal of demonstration summary that shows AP unrestrained parts temporarily removed on orbit are held captive or tethered.	D	CofC	
					Verification shall be by demonstration. The demonstration shall show that unrestrained parts that may be temporarily removed on orbit will be held captive. Verification shall be considered successful if it has been demonstrated that all unrestrained parts that may be temporarily removed on orbit are tethered or otherwise held captive.	b) JSC review, inspection and acceptance of AP demonstration summary to assure all unrestrained parts temporarily removed on orbit are tethered or otherwise held captive.			
195	IRD SSP 57003	3.8.4.2.7.1 4.3.8.4.2.7.1	A	Screws and Bolts	Screws and bolts, except internal ORU screws and bolts, in established worksites (planned and unplanned contingency) and translation route corridors with exposed threads protruding greater than 0.12" shall have protective features (caps) that do not prevent installation or removal of the fastener, but do protect against sharp threads.	a) Development and submittal of analysis summary that demonstrates AP data from drawings, integration documentation, and operational procedures to verify screws/bolts which exceed the length specified in 3.8.4.2.7.1 and the required use of guards or covers due to location in crewmember translation paths and maintenance worksites.	A	CofC	
					Securing pins in handrails shall be designed to prevent their inadvertently backing out above the handhold surface.				
					An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify screws and bolts which exceed the length specified in 3.8.4.2.7.1 and the required use of guards or covers due to location in crewmember translation paths and maintenance worksites.	b) JSC review, inspection and acceptance of AP analysis and inspection summary shows that screws and bolts which exceed the specified length in 3.8.4.2.7.1 have been properly covered, or guarded.			
					A drawing inspection shall show that the required cover installation has been accomplished or proper guards are in place. Verification shall be considered successful when analysis and inspection shows that screws and bolts which exceed the specified length have been properly covered, or guarded.				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
196	IRD SSP 57003	3.8.4.2.7.2 4.3.8.4.2.7.2	A	Securing Pins	An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows the requirement has been met.	a) Development and submittal of analysis summary that demonstrates AP and flight drawings to verify handrail securing pins are designed to prevent inadvertent backing out above the handhold surface and screws/bolts in established worksites	A	CofC	No requirement specified
						and translation route corridors with exposed threads protruding greater than 0.12" have protective features (caps). b) JSC review, inspection and acceptance of AP analysis shows the requirement has been met.			
197									
198	IRD SSP 57003	3.8.4.2.8 4.3.8.4.2.8	A	Safety Critical Fasteners	Safety critical fasteners shall be designed to prevent inadvertent back out. A test shall be performed to verify that safety critical fasteners will not back out under all environmental conditions. Verification shall be considered successful when safety critical fasteners will not back out.	a) Development, and submittal of test summary that demonstrates AP safety critical fasteners will not back out under all environmental conditions.	T	CofC	
						b) JSC review, inspection and acceptance of AP test summary to assure AP safety critical fasteners will not back out under all environmental conditions.			
199	IRD SSP 57003	3.8.4.2.9 4.3.8.4.2.9	A	Levers, Cranks, hooks, and Controls	Levers, cranks, hooks, and controls shall be located such that they cannot pinch, snag, cut, or abrade the crewmembers or their clothing. Verification shall be by analysis and inspection.	a) Development and submittal of analysis and inspection summary that demonstrates AP data from drawings, integration documentation, and operational procedures identify levers, cranks.	A&I	CofC	
					An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify levers, cranks, hooks and controls and the required use of guards or covers due to location in crewmember translation paths and maintenance worksites.	, hooks and controls and utilize guards/covers due to location in crewmember translation paths and maintenance worksites are in place			
					A drawing inspection shall show that the required cover installation has been accomplished or proper guards are in place. Verification shall be considered successful when analysis and inspection shows that all	b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure all levers, cranks, hooks, and controls have been properly covered, or guarded.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					levers, cranks, hooks, and controls have been properly covered, or guarded.				
200	IRD SSP 57003	3.8.4.3 4.3.8.4.3	A	Moving or Rotating Equipment	The EVA crewmember shall be protected from moving or rotating equipment. An analysis shall be performed using data from drawings, operational procedures, integration documentation, and time lines to identify equipment that is designed to rotate or move, operations that	a) Development and submittal of analysis that demonstrates AP data from drawings, operational procedures, integration documentation, and time lines to verify equipment that is designed to rotate/move to include controls to prevent unwanted equipment movement during EVA crew translation or moving equipment.	A	CofC	
					require EVA crewmembers to be in the area of the equipment, scenarios involving direct interface between EVA crewmembers and the equipment, and controls to prevent unwanted equipment movement.				
					Analysis shall be performed to verify that EVA crew is not required to operate or translate near hazardous moving equipment. Verification shall be considered successful when the analysis verifies that it is not necessary for the EVA crewmembers to operate near moving or rotating equipment.	b) JSC review, inspection and acceptance of AP analysis summary to assure EVA crewmembers do not translate near moving or rotating equipment.			
201	IRD SSP 57003	3.8.4.4 4.3.8.4.4	A - 57003 NA - 57213	Power Sources	Design of any nuclear reactor power source or radioisotopic generator power source located on an attached payload shall protect crewmembers from radiation exposure. Verification shall be by analysis.	a) Submittal of analysis summary that demonstrates AP drawings, operational procedures, integration documentation and timelines for nuclear power source or radioisotopic generator power source that require EVA crewmembers to be in the area of the equipment to protecting crewmembers from radiation exposure.	A	CofC	
					Verification shall be considered successful when the analysis verified that the hardware provides the required radiation protection.				
					An analysis shall be performed using data from drawings, operational procedures, integration documentation and timelines to identify equipment that is designed to used nuclear power source or radioisotopic generator power source that require EVA crewmembers to be in the area of the equipment and the method for protecting the crewmembers from radiation exposure.	b) JSC review, inspection and acceptance of AP analysis summary to assure AP hardware provides the required radiation protection.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
202	IRD SSP 57003	3.8.4.5 4.3.8.4.5	A - 57003 NA - 57213	Transmitters	APs with high power electromagnetic wave transmitters shall protect crew members from harmful exposure to non-ionizing radiation. in the event of EVA proximity operations near an attached payload with high power electromagnetic wave transmitters, attached payloads shall implement safing procedures to temporally inhibit high power electromagnetic wave transmitters from operating during the duration of the EVA proximity operations.	a) Development, and submittal of analysis summary that demonstrates AP data from drawings, operational procedures, integration documentation, and time lines to identify equipment with high power electromagnetic wave transmitters and the procedures to verify EVA crewmembers protection from harmful exposure to non-ionizing radiation.	A	CofC	
					An analysis shall be performed using data from drawings, operational procedures, integration documentation, and time lines to identify equipment with high power electromagnetic wave transmitters and the procedures to protect EVA crewmembers from harmful exposure to non-ionizing radiation.	The verification shall be considered successful when the analysis verifies that the safing procedure to inhibit high power electromagnetic wave transmitters from operating during EVA proximity operations are properly documented.			
					The verification shall be considered successful when the analysis verifies that the safing procedure to inhibit high power electromagnetic wave transmitters from operating during EVA proximity operations are properly documented. The following categories of functions/equipment shall utilize crew interaction or crew observation for manual failure detection, isolation annunciation, and recovery for Human/equipment interfaces such that visual display devices, cursor control devices, and manual input devices shall be in accordance with SSP 50005, para 12.3.2.1	b) JSC review, inspection and acceptance of AP analysis summary to assure safing procedure inhibit high power electromagnetic wave transmitters from operating during EVA proximity operations.			
203	IRD SSP 57003	3.9.1.1.1 4.3.9.1.1.1	A - 57003 NA - 57213	Manual Failure Detection, Isolation, and Recovery	A. Verification shall be by analysis using data from Hazard Analysis Reports, Reliability Block Diagram Analysis (RBDA), FMEA, schematics, Logistics Support Analysis Record (LSAR) and software detailed design drawings. The requirements are considered successful when the analysis shows that human/equipment interfaces such as visual display devices, cursor control devices, and manual input devices are in accordance with SSP 50005, paragraph 12.3.2.1.	a,b,c,d,e) Development, and submittal of analysis summary that demonstrates AP Hazard Analysis Reports, Reliability Block Diagram Analysis (RBDA), FMEA, schematics, Logistics Support Analysis Record (LSAR) and software detailed design drawings verify human/equipment interfaces such as visual display devices, cursor control devices, structural, mechanical, electromechanically, and electrical equipment and manual input devices are in accordance with SSP 50005, paragraph 12.3.2.1, IRD SSP 57003 paras 3.9.1.1.1.C/E.	A	CofC	No specific requirements for B and D
					B. Verification shall be by analysis using data from Hazard Analysis Reports, RBDA, FMEA,	f) JSC review, inspection and acceptance of AP analysis summary to			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					schematics, LSAR and software detailed design drawings. The requirements are considered successful when the analysis shows that general and specialized lighting are in accordance with the requirements.	assure AP Hazard Analysis Reports, Reliability Block Diagram Analysis (RBDA), FMEA, schematics, Logistics Support Analysis Record (LSAR) and			
					C. Verification shall be by analysis using data from Hazard Analysis Reports, RBDA, FMEA, schematics, LSAR and software detailed design drawings. The requirements are considered successful when the analysis shows compliance with paragraph 3.9.1.1.1.C.	software detailed design drawings verify human/equipment interfaces such as visual display devices, cursor control devices, structural, mechanical, electromechanically, and electrical equipment and manual input devices are in accordance with SSP 50005, paragraph 12.3.2.1, IRD SSP 57003 paras 3.9.1.1.1.C/E.			
					D. Verification shall be by analysis using data from Hazard Analysis Reports, RBDA, FMEA, schematics, LSAR and software detailed design drawings. The requirements are considered successful when the analysis show that structural, mechanical, electromechanical and electrical equipment are in accordance with the requirements as specified.				
					E. Verification shall be by analysis using data from Hazard Analysis Reports, RBDA, FMEA, schematics, LSAR and software detailed design drawings. The requirements are considered successful when the analysis shows that they are in accordance with paragraph 3.9.1.1.1.E.				
204	IRD SSP 57003	3.9.1.3 4.3.9.1.3	A - 57003 NA - 57213	Access	A. Payload hardware shall be geometrically arranged to provide physical and visual access for all payload installation, operations, and maintenance Verification shall be by inspection and analysis of drawings. The verification shall be considered successful when the inspection and analysis shows that the AP provides physical and visual access to all payload installation, operations, and maintenance tasks.	a) Development, and submittal of analysis and inspection summary that demonstrates AP physical and visual access to all payload installation, operations, and maintenance tasks.	I&A	CofC	
					B. Access to inspect or replace an item (i.e. a payload remove.replace item) shall not require removal of another ORU or more than one access cover Verification shall be by inspection and analysis of drawings. The verification shall be considered successful when the inspection and analysis shows that the AP provides access to inspect or replace an ORU without removal of another ORU or more than one access cover.	b) Development, and submittal of analysis and inspection summary that demonstrates AP access to inspect or replace an ORU without removal of another ORU or more than one access cover.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					C. Attached payload shall provide EVA access for attached payload remove and replace items in accordance with SSP 50005, para 14.3.2.3.1 and 14.4.3. Verification shall be by inspection and analysis of drawings. The verification shall be considered successful when the inspection and analysis shows that the Attached Payload provides EVA access to remove and replace an ORU in accordance with SSP 50005, paragraphs 14.3.2.3.1 and 14.4.3.	c) Development, and submittal of analysis and inspection summary that demonstrates AP EVA access to remove and replace an ORU in accordance with SSP 50005, paragraphs 14.3.2.3.1 and 14.4.3.			
					D. Equipment to which rear access is required shall be free to open or rotate to its full distance and remain in the "open" position without being supported by hand. Verification shall be by inspection and analysis of drawings. The verification shall be considered successful when the inspection and analysis shows that the AP meets the requirement of 3.9.1.3 D.	d) Development, and submittal of analysis and inspection summary that demonstrates AP meets the requirement of 3.9.1.3 D. e) JSC review, inspection and acceptance of AP analysis and inspection summary to assure AP physical and visual access to all payload installation, operations, and maintenance tasks, access to inspect or replace an ORU without removal of another ORU or more than one access cover in accordance with SSP 50005, paras. 14.3.2.3.1 and 14.4.3 and IRD SSP 57003, and para. 3.9.1.3 D.			
205	IRD SSP 57003	3.9.1.4 4.3.9.1.4	A - 57003 NA - 57213	Nonpressurized Area Equipment Maintenance Time	A. AP equipment shall be designed such that maintenance tasks can be divided into subtasks that can be completed in a single EVA sortie in less than 3 hours. Verification shall be performed by analysis consisting of integrating program generated documentation from maintainability data and data made available from engineering tests and worksite analysis. The verification shall be considered successful when the integrated analysis proves that the equipment is designed such that the maintenance subtasks can be completed in a single EVA sortie of less than 3 hours.	a) Development and submittal of analysis summary that demonstrates AP that includes integrating program generated documentation from maintainability data and data made available from engineering tests and worksite analysis to prove the equipment is designed such that the maintenance subtasks can be completed in a single EVA sortie of less than 3 hours.	A	CofC	
					B. Worksite maintenance tasks exceeding 3 hours shall be partitioned and safed into subtasks of less than 3 hours so that the task can be resumed on a succeeding EVA. Verification shall be performed by analysis consisting of integrating program generated documentation from maintainability data and data made available from engineering tests and worksite analysis. The verification shall be	b) Development and submittal of analysis summary that demonstrates AP integrating program generated documentation from maintainability data and data made available from engineering tests and worksite analysis proves that the requirements can be met.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					considered successful when the integrated analysis proves that the requirements can be met.				
						c) JSC review, inspection and acceptance of AP integrated analysis to assure the equipment is designed such that the maintenance subtasks can be completed in a single EVA sortie of less than 3 hours.			
206	IRD SSP 57003	3.9.1.5 4.3.9.1.5	A - 57003 NA - 57213	Access Item Retainment	The attached payload shall provide a means (i.e. hinges, tethers, etc.) to retain access covers, caps, and other structural parts that require on orbit maintenance or other planned activates clear of the worksite working volume in accordance with SSP 50005, para. 12.3.1.2.	a1) Development and submittal of analysis and inspection summary that demonstrates engineering design drawings and data obtained from neutral buoyancy and 1-g development testing incorporates restraining provisions for removable items based on the analysis.	A&I	CofC	
						a2) NBL Testing The verification shall be considered successful when the analysis, test data and inspections show that the covers, caps, and other structural parts, removed to gain access for a planned maintenance task, are capable of being retained clear of the worksite working volume.			
					Verification shall be by analysis and inspection. An analysis shall be performed using the engineering design drawings and data obtained from neutral buoyancy and 1-g development testing.	a3) Design review, analysis, and operational assessment to assure attached payload provides means to retain access covers, caps, and other structural parts that require on orbit maintenance or other planned activates clear of the worksite working volume in accordance with SSP 50005, para. 12.3.1.2			
					The inspection of design drawings shall show that the design incorporates restraining provisions for removable items based on the analysis. The verification shall be considered successful when the analysis, test data and inspections show that the covers, caps, and other structural parts, removed to gain access for a planned maintenance task, are capable of being retained clear of the worksite working volume.	b) JSC review, inspection and acceptance of AP analysis and inspection summary that demonstrates engineering design drawings and data obtained from neutral buoyancy and 1-g development testing incorporates restraining provisions for removable items based on the analysis.			
207	IRD	3.9.1.5.1	A - 57003	Captive Parts	Payloads and payload equipment shall be	a) Development and submittal of	D&I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
	SSP 57003	4.3.9.1.5.1	NA - 57213		designed in such a manner to ensure that all unrestrained parts (e.g. knobs, handles, lens covers, access plates, or similar devices) that may be temporally removed on orbit will be tethered or otherwise held captive. Captive parts shall be verified by demonstration and inspection.	demonstration summary that shows all unrestrained parts that are temporarily removed on orbit are all unrestrained parts that may be temporally removed on orbit will be tethered or otherwise held captive. b) JSC review, inspection and acceptance of AP inspection and demonstration summary to assure all unrestrained parts that are temporarily removed on orbit are held captive.			
					Verification shall be considered successful when a demonstration and inspection shows that all unrestrained parts that are temporarily removed on orbit are held captive.				
208	IRD SSP 57003	3.9.1.6.1 4.3.9.1.6.1	A - 57003 NA - 57213	Method- Installation/Removal	The replaceable items shall be removable with a gloved hand alone or with common hand tools found in the EVA generic tool list in SSP 30256:001, tables 3.2-1/2..	a) Development and submittal of analysis summary that demonstrates AP replaceable items (ORUs or maintenance items) are removable with the gloved hand alone or with common hand tools in accordance with the gloved hand alone or with the common hand tools found in the EVA Tool List in SSP 30256:001, tables 3.2-1/2.	A	CofC	
					Verification shall be by analysis. The analysis shall determine that replaceable items (ORUs or maintenance items) are removable with the gloved hand alone or with common hand tools. The verification shall be considered successful when all replaceable items are removable with the gloved hand alone or with the common hand tools found in the EVA Tool List in SSP 30256:001.	b) JSC review, inspection and acceptance of AP analysis summary to assure AP replaceable items (ORUs or maintenance items) are removable with the gloved hand alone or with common hand tools in accordance with the gloved hand alone or with the common hand tools found in the EVA Tool List in SSP 30256:001.			
209	IRD SSP 57003	3.9.1.6.2 4.3.9.1.6.2	A - 57003 NA - 57213	Equipment Item Interconnecting Devices	The AP shall provide utility line attachment/mounting length to allow removal/replacement of the equipment item. An analysis shall be performed using equipment/installation drawings, maintenance procedures contained in the LSAR, maintainability analysis and data obtained from neutral buoyancy and 1-g development testing, and hardware integration testing.	a) Development, and submittal of analysis summary that demonstrates AP equipment/installation drawings, maintenance procedures contained in the LSAR, maintainability analysis and data obtained from neutral buoyancy and 1-g development testing, and hardware integration testing proving utility line attachment/mounting length has been provided for maintenance.	A	CofC	
					The verification shall be considered successful when the analysis proves that utility line attachment/mounting length has been provided	b) JSC review, inspection and acceptance of AP analysis summary to assure equipment/installation drawings,			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					for maintenance.	maintenance procedures contained in the LSAR, maintainability analysis and data obtained from neutral buoyancy and 1-g development testing, and hardware integration testing proving utility line attachment/mounting length has been provided for maintenance.			
210	IRD SSP 57003	3.9.1.6.3 4.3.9.1.6.3	A - 57003 NA - 57213	Incorrect Equipment Installation	The AP remove/replace shall contain physical provisions (a structural or mechanical barrier) to preclude incorrect installation of equipment . An analysis of engineering drawings shall be performed to verify that features are provided to preclude incorrect installation of equipment. The verification shall be considered successful when the analysis shows that physical provisions (i.e., guides, location pins, orientation marks, etc.) have been incorporated to control the likelihood of an incorrect installation.	a) Development and submittal of analysis summary that demonstrates AP features are provided to preclude incorrect installation of equipment per installation/equipment drawings of physical design provisions (i.e., guides, location pins, orientation marks, etc.) have been incorporated to control the likelihood of an incorrect installation. b) JSC review, inspection and acceptance of AP analysis summary to assure AP features are incorporated to control the likelihood of an incorrect installation.	A	CofC	
211	IRD SSP 57003	3.8.4.2.7.3 4.3.8.4.2.7.3 3.9.1.6.4 4.3.9.1.6.4 3.8.4.2.7.3 4.3.8.4.2.7.3	A - 57003 NA - 57213	Lockwiring and Staking	An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows the requirement has been met in 3.8.4.2.7.3. No attached payload maintenance equipment installation or operational interface shall be lockwired or staked.	a) Development and submittal of inspection summary demonstrates AP drawings to verify that no lockwire or staking is used.	A&I	CofC	
					No AP planned maintenance equipment installations or operational interfaces shall be lockwired or staked. An inspection of drawings shall be performed to verify that no lockwire or staking is used. The verification shall be considered successful when inspection proves that no planned maintenance equipment installations or operational interfaces are lockwired or staked.	b) JSC review, inspection and acceptance of AP drawings against the hardware to assure no planned maintenance equipment installations or operational interfaces are lockwired or staked.			
212	IRD SSP 57003	3.9.1.6.5 4.3.9.1.6.5	A - 57003 NA - 57213	Restraining and handling devices for Temporary Storage	A. AP external equipment shall allow for restraining and handling by EVA crew to provide temporary storage. An analysis of engineering design drawings shall be performed to verify that restraining and handling devices are provided for the EVA crew for equipment items designated for removal and replacement.	a1) Development and submittal of analysis summary to verify AP hardware and flight drawings are in accordance with 3.8.4.2.7.3. a2) Development and submittal of analysis summary that demonstrates AP engineering design drawings verify restraining and handling devices are	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						provided for the EVA crew for equipment items designated for removal and temporary storage			
					The verification shall be considered successful when the analysis proves that these devices have been incorporated in the system design for the planned temporary storage.	b1) JSC review, inspection and acceptance of AP analysis summary to assure AP hardware and flight drawings are in accordance with 3.8.4.2.7.3. b2) Development and submittal of analysis summary that demonstrates AP engineering design drawings verify that restraining and handling devices are provided for external equipment items that use robotic devices to provide temporary storage.			
						c) JSC review, inspection and acceptance of AP analysis summary to assure restraining and robotic devices incorporated in the system design for the planned temporary storage.			
					B. Attached payload external equipment that uses robotic devices for planned maintenance shall also allow for the restraining and handling by the robotic devices to provide temporary storage. An analysis of engineering design drawings shall be performed to verify that restraining and handling devices are provided for external equipment items that use robotic devices to provide temporary storage.	B. AP external equipment that uses robotic devices for planned maintenance shall also allow for the restraining and handling by the robotic devices to provide temporary storage.			
					The verification shall be considered successful when the analysis proves that these devices have been incorporated in the system design for the planned temporary storage.	An analysis of engineering design drawings shall be performed to verify that restraining and handling devices are provided for external equipment items that use robotic devices to provide temporary storage. The verification shall be considered successful when the analysis proves that these devices have been incorporated in the system design for the planned temporary storage.			
213	IRD SSP 57003	3.9.1.6.6 4.3.9.1.6.6	A - 57003 NA - 57213	Installation/Removal Force	Hardware mounted into a capture-type receptacle that requires a push-pull action shall require a force less than 35lbf (156 N) to install or remove . Push-pull forces shall be verified by analysis. Verification shall be considered successful	a) Development and submittal of analysis summary that demonstrates AP forces mounted into a capture-type receptacle requires push-pull action less than 35 lbf (156 N) to install and remove.	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					when an analysis of the payload flight hardware shows that hardware mounted into a capture-type receptacle that requires push-pull action requires a force less than 35 lbf (156 N) to install and remove.	b) JSC review, inspection and acceptance of AP analysis summary to assure AP forces mounted into a capture-type receptacle requires push-pull action less than 35 lbf (156 N) to install and remove.			
214	IRD SSP 57003	3.9.1.6.6.1 4.3.9.1.6.6.1	A - 57003 NA - 57213	Direction of Removal	Replaceable items remove/replace or maintenance) shall be removal along a straight path until they have cleared the surrounding structure. Direction of Removal shall be verified by analysis. Verification shall be considered successful when an analysis of the AP flight hardware drawings shows that an AP ORU can be removable along a straight path.	a) Submittal of analysis summary that demonstrates direction of removal of AP ORU can be removable along a straight path. b) JSC review, inspection and acceptance of AP analysis summary to assure direction of removal of AP ORU can be removable along a straight path.	A	CofC	
215	IRD SSP 57003	3.9.1.6.6.2 4.3.9.1.6.6.2	A - 57003 NA - 57213	Visibility	The forward edges of the equipment items shall be visible to the restrained crewmember during alignment and attachment. Visibility shall be verified by analysis.	a) Submittal of analysis summary that demonstrates AP visibility of all forward edges of the payload equipment to the restrained during alignment and attachment.		CofC	
					Verification shall be considered successful when an analysis of the payload flight hardware drawings shows that all forward edges of the payload equipment item are visible to the restrained crewmember during alignment and attachment.	b) JSC review, inspection and acceptance of AP analysis summary to assure AP visibility of all forward edges of the payload equipment item to the restrained crewmember during alignment and attachment.			
216	IRD SSP 57003	3.9.1.6.6.3 4.3.9.1.6.6.3	A - 57003 NA - 57213	Mounting Alignment	A. Alignment methods shall be verified by inspection.	a) Submittal of inspection summary that demonstrates AP alignment methods are properly marked, labeled or designed to facilitate proper installation.	A	CofC	
					Verification shall be considered successful when an inspection shows the equipment items are properly marked, labeled or designed to facilitate proper installation.	b) Submittal of inspection summary that demonstrates AP alignment marks be verified by inspection to verify alignment marks are applied to mating parts and (1) the marks are aligned in the installed position, and (2) the marks consist of a straight or curved line of a width and length to allow accurate alignment.			
					B. Alignment marks shall be verified by inspection. Verification shall be considered successful when an inspection shows the alignment marks are applied to mating parts and (1) the marks are aligned in the installed position, and (2) the marks consist of a straight	c) Development and submittal of inspection summary that demonstrates AP electrical connector shell alignment and mating meet the requirements of 3.9.1.6.6.3 C.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					or curved line of a width and length to allow accurate alignment.				
					C. Electrical connector shell alignment and mating shall be verified by inspection. Verification shall be considered successful when an inspection shows the electrical connectors meet the requirements of 3.9.1.6.6.3 C.	d) JSC review, inspection and acceptance of AP inspection summaries to assure alignment methods are properly marked, labeled or designed to facilitate proper installation, alignment marks are applied, and electrical connector shell alignment and mating meet the requirements of IRD SSP 57003 para. 3.9.1.6.6.3 C.			
217	IRD SSP 57003	3.9.1.6.7.1 4.3.9.1.6.7.1	A - 57003 NA - 57213	ORU CLA and Umbilical Mechanism Assembly EVA Overrides	The attached payload shall provide EVA access for the CLA and UMA . Verification shall be by analysis.	a) Development, and submittal of analysis that demonstrates AP flight drawings (on orbit configuration) for EVA access for CLA & UMA override is provided in accordance SSP 30256 and EVA access to the CLA and UMA.	A	CofC	
					Verification shall be considered successful when an analysis of the Attached Payload flight drawings (on orbit configuration) shows that EVA access for CLA & UMA override has been provided in accordance SSP 30256.	b) JSC review, inspection and acceptance of AP flight drawings (on orbit configuration) to assure EVA access for CLA & UMA override is provided in accordance SSP 30256.			
218	IRD SSP 57003	3.9.1.6.7.2 4.3.9.1.6.7.2	A - 57003 NA - 57213	PAS & UCCAS ORU EVA Maintenance	The payload shall provide EVA access for PAS and UCCAS ORU (CLA, UMA, and guide vane) maintenance per SSP 50005, paras. 14.3.2.3.1 and 14.4.3.	a) Development and submittal of analysis summary that demonstrates AP flight drawings (on orbit configuration) are in accordance with hardware EVA access for PAS & UCCAS ORU (CLA, UMA & Guide Vane) maintenance per SSP 50005 paras. 14.3.2.3.1 and 14.4.3	A	CofC	
					Verification shall be by analysis. Verification shall be considered successful when an analysis of the Attached Payload flight drawings (on orbit configuration) shows that EVA access for PAS & UCCAS ORU (CLA, UMA & Guide Vane) maintenance per SSP 50005 has been provided.	b) JSC review, inspection and acceptance of AP analysis summary to assure EVA access for PAS & UCCAS ORU (CLA, UMA & Guide Vane) maintenance per SSP 50005.			
219	IRD SSP 57003	3.9.1.6.7.3 4.3.9.1.6.7.3	A - 57003 NA - 57213	AP Remove/Replace Items	Remove/replace items designed for dexterous robotic manipulation shall also be maintainable by EVA Verification shall be by analysis.	a) Development and submittal of analysis summary that demonstrates AP maintainability data defining repairs to be performed on orbit and EVA capability in accordance with SSP 50005 for dexterous robotic manipulation are maintainable by EVA	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					An analysis shall be performed using maintainability data to define those repairs to be performed on orbit and determine EVA capability in accordance with SSP 50005. The verification shall be considered successful when data shows that the Attached Payload is maintainable by EVA.	b) JSC review, inspection and acceptance of AP analysis summary in accordance with SSP 50005 to assure EVA maintainability.			
220	IRD SSP 57003	3.9.1.7 4.3.9.1.7	A - 57003 NA - 57213	Standard EVA/EVR Interfaces	A. Hardware located in non-pressurized areas shall be in accordance with SSP 30256:001, para. 3.1. An analysis of engineering design drawings shall be performed to verify that standard EVA interfaces are used with equipment items designated for on-orbit, maintenance in nonpressurized areas.	a) Development and submittal of analysis summary that demonstrates AP standard EVA interfaces are manipulated by EVA is in accordance with SSP 30256:001, para 3.1.	A	CofC	
					The verification shall be considered successful when the analysis proves that each device to be manipulated by EVA is in accordance with SSP 30256:001.				
					B. Hardware located in nonpressurized areas to be manipulated by EVR systems shall be in accordance with SSP 42004, sections A3, B3, C3, D3, E3, and 13, as applicable.	b) Development and submittal of analysis summary that demonstrates AP standard EVR interfaces used with equipment items designated for on-orbit, maintenance in nonpressurized areas manipulated by EVR is in accordance with SSP 42004 and SSP 42003, sections A3, B3, C3, D3, E3, and 13, as applicable.			
					An analysis of engineering design drawings shall be performed to verify that standard EVR interfaces are used with equipment items designated for on-orbit, maintenance in nonpressurized areas.				
					The verification shall be considered successful when the analysis proves that each device to be manipulated by EVR is in accordance with SSP 42004 and SSP 42003, Space Station Manned Base to Mobile Servicing System ICD.	c) JSC review, inspection and acceptance of AP analysis summary that demonstrates AP manipulated by EVA is in accordance with SSP 30256:001 and SSP 42004 and SSP 42003 (EVR interfaces).			
221	IRD SSP 57003	3.9.1.7.1 4.3.9.1.7.1	A - 57003 NA - 57213	EVA Tools	AP equipment on-orbit inspection remove/replace and maintenance tasks requiring EVA shall utilize tool specified in SSP 30256:001, table 3.2-1/2.	a) Development and submittal of inspection and test summary that demonstrates AP is externally maintainable with the specified tools of SSP 30256:001, table 3.2-1/2	I T?	CofC	
					Verification shall be by inspection of design	b) JSC review, inspection and			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					drawings and test data. The Verification shall be considered successful when the inspection show that the AP is externally maintainable with the specified tools of SSP 30256:001.	acceptance of AP inspection and test summary to assure AP is externally maintainable with the specified tools of SSP 30256:001.			
222	IRD SSP 57003	3.9.1.7.1.1 4.3.9.1.7.1.1	A - 57003 NA - 57213	Tool Clearance	A. Equipment and structures surrounding bolts requiring EVA ratcheting shall protect a 90 degree throw angle and shall allow for a right or left handed operations.	a,b,c) Development and submittal of test and inspection summary that demonstrates AP equipment and structures surrounding bolts requiring EVA ratcheting shall protect a 90 degree throw angle, clearances per figure 3.9.1.7.1.1-1, allowance for right or left handed operation as defined in Figure 3.9.1.7.1.1-1.	I	CofC	
					Verification shall be by inspection of design drawings and test data. Verification shall be considered successful when the data shows that the AP equipment and structures surrounding bolts requiring EVA ratcheting shall protect a 90 degree throw angle and shall allow right or left handed operation.				
					B. Structure surrounding tool actuated fasteners shall provide 3" clearance for EVA glove-hand access around the tool handle for the sweep of the handles shown in figure 3.9.1.7.1.1-1	b) JSC review, inspection and acceptance of AP test and inspection summary to assure AP equipment and structures surrounding bolts requiring EVA ratcheting shall protect a 90 degree throw angle, clearances per figure 3.9.1.7.1.1-1, allowance for right or left handed operation as defined in Figure 3.9.1.7.1.1-1.			
					Verification shall be by inspection of design drawings and test data. Verification shall be considered successful when the data shows that the Attached Payload structure surrounding tool actuated fasteners provides the proper clearance as shown in figure 3.9.1.7.1.1-1.				
					C. Equipment and structure surrounding EVA tool actuated fasteners shall provide EVA tool head clearance as defined in Figure 3.9.1.7.1.1-1, except when fasteners are released using a robotic interface.	c) JSC review, inspection and acceptance of AP analysis, inspection, and test summary to assure demonstration summary that shows one-handed operation when all connectors can be mated/demated using only one hand and the design and placement of connectors does not preclude the use of either hand.			
					Verification shall be by inspection of design				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					drawings and test data. Verification shall be considered successful when the data shows that the AP provides tool head clearance as defined in Figure 3.9.1.7.1.1-1.				
223	IRD SSP 57003	3.9.1.7.3.2 4.3.9.1.7.2 4.3.9.1.6.6.3 3.9.1.6.6.3	A - 57003 NA - 57213	Payload Hardware and Equipment Mounting	A, 3.1.6.6.3 - Equipment shall be designed, labeled, or marked to facilitate proper installation	a) Design review, analysis, and operational assessment to assure AP equipment is designed, labeled, or marked to facilitate proper installation	D&I	CofC	
					B. 3.1.6.6.3 - When alignment marks are used, they shall be applied to both mating parts, align when the parts are in the installed position, and consist of a straight or curved line of width and length to allow accurate alignment	b) Design review, analysis, and operational assessment to assure AP alignment marks are used, applied to both mating parts, aligned when the parts are in the installed position, and consist of a straight or curved line of width and length to allow accurate alignment			
					C. 3.1.6.6.3 - All electrical connectors shall have provisions for alignment and mating of connector shells prior to electrical path completion.	c) Design review, analysis, and operational assessment to assure all attached payload hardware electrical connectors have provisions for alignment and mating of connector shells prior to electrical path completion 3.9.1.7.2 .			
					A. 3.1.7.3.2 - .Attached payload hardware shall be designed, labeled, and marked to prevent improper installation. Equipment Mounting shall be verified by demonstration and inspection. The verification shall be considered successful when the demonstration and inspection shows that the payload hardware is designed, labeled, or marked to prevent improper installation				
					B 3.1.7.3.2 - Alignment marks that are used shall be consistent on both mating parts. Alignment marks shall be verified by demonstration and inspection. The verification shall be considered successful when the demonstration and inspection shows that the payload hardware alignment marks that are used are consistent and on both mating parts.	d) JSC review, inspection and acceptance of AP summaries to assure AP hardware ware is designed, labeled, or marked to prevent improper installation and alignment marks that are used are consistent and on both mating parts.			
224	IRD SSP 57003	3.9.1.7.3 4.3.9.1.7.3	A - 57003 NA - 57213	Connectors	Attached payload connectors shall conform to the connector design requirements in SSP 50005, para. 14.6.4.3	a) Development, and submittal of inspection summary that demonstrates AP flight drawings and hardware	A&I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					Verification shall be by inspection. Verification shall be considered successful when the inspection of Attached Payload flight drawings and hardware shows connectors conform to the design requirements in SSP 50005, paragraph 14.6.4.3.	shows connectors conform to the design requirements in SSP 50005, paragraph 14.6.4.3. b) JSC review, inspection and acceptance of AP inspection summary to assure AP flight drawings and hardware shows connectors conform to the design requirements in SSP 50005, paragraph 14.6.4.3.			
225	IRD SSP 57003	3.9.1.7.3.1. 4.3.9.1.7.3.1	A - 57003 NA - 57213	One-Handed Operation	A. All connectors whether operated by hand or tool, shall be designed so they can be mated/demated using one hand One-handed operation shall be verified by demonstration. Verification shall be considered successful when the demonstration shows the all connectors can be mated/demated using only one hand.	a,b) Development, and submittal of demonstration summary that shows one-handed operation when all connectors can be mated/demated using only one hand and the design and placement of connectors does not preclude the use of either hand.	D	CofC	
					B. Connector design and placement shall not preclude the use of either the right or the left hand. One-handed operation shall be verified by demonstration. Verification shall be considered successful when the demonstration shows the design and placement of connectors does not preclude the use of either hand.	c) JSC review, inspection and acceptance of AP analysis, inspection, and test summary to assure demonstration summary that shows one-handed operation when all connectors can be mated/demated using only one hand and the design and placement of connectors does not preclude the use of either hand.			
226	IRD SSP 57003	9.1.7.3.2 4.3.9.1.7.3.2	A - 57003 NA - 57213	Mate/Demate	A. It shall be possible to mate/demate individual connectors without having to remove or mate/demate other connectors. Accessibility shall be verified by analysis. Verification shall be considered successful when an analysis of the payload flight hardware drawings shows that it is possible to mate/demate individual connectors without having to remove or mate/demate other connectors.	a,b) Development and submittal of analysis summary that demonstrates AP accessibility shows that it is possible to mate/demate individual connectors without having to remove or mate/demate other connectors and it is possible to disconnect and reconnect electrical connectors and cable installations without damage to wiring connectors.	A	CofC	
					B. Electrical connectors and cable installations shall permit disconnection and reconnection without damage to wiring connectors. Verification shall be by analysis. Verification shall be considered successful when an analysis of the payload hardware drawings shows that it is possible to disconnect and reconnect electrical connectors and cable installations without damage to wiring connectors.	c) JSC review, inspection and acceptance of AP analysis, inspection, and test summary to assure AP accessibility shows that it is possible to mate/demate individual connectors without having to remove or mate/demate other connectors and it is possible to disconnect and reconnect electrical connectors and cable installations without damage to wiring connectors.			

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227	IRD SSP 57003	3.9.1.7.3.3 4.3.9.1.7.3.3	A - 57003 NA - 57213	Connector Arrangement	A. Space between connectors and adjacent obstructions shall be a minimum of 1.6" for EVA access. Verification shall be by inspection. Inspection of Attached Payload flight drawings will be used to evaluate spacing and connector arrangement. Verification shall be considered successful when it is shown that the space between connectors and adjacent obstructions shall be a minimum of 1.6 inches for EVA access.	a) Development and submittal of inspection summary that demonstrates AP space between connectors/adjacent obstructions are a minimum of 1.6 inches for EVA access and IRD SSP 57003 ,para. 3.9.1.7.3.3 B to show connectors in a single row or staggered rows which are removed sequentially by the crew shall provide 1.6" of clearance from other connectors a and/or adjacent obstructions for 270 degrees of sweep around each connector beginning at the start of the removal/replacement sequence	I	CofC	
					B. Connectors in a single row or staggered rows which are removed sequentially by the crew shall provide 1.6" of clearance from other connectors a and/or adjacent obstructions for 270 degrees of sweep around each connector beginning at the start of the removal/replacement sequence. Verification shall be by inspection. Inspection of AP flight drawings will be used to evaluate connector arrangement. Verification shall be considered successful when it is shown that the requirement of 3.9.1.7.3.3 B is met.	b) JSC review, inspection and acceptance of AP inspection summary to assure AP space between connectors/adjacent obstructions are a minimum of 1.6 inches for EVA access and IRD SSP 57003 ,para. 3.9.1.7.3.3 B.			
228	IRD SSP 57003	3.9.1.7.3.3.1 4.3.9.1.7.3.3.1	A - 57003 NA - 57213	Status	Method status shall be provided to indicate connector mating status Verification shall be by demonstration. The demonstration shall show that connector mating status can be determined. The verification shall be considered successful when a method exists to determine connector mating status.	a) Development and submittal of demonstration summary that show AP connector mating status when a method exists to determine connector mating status. b) JSC review, inspection and acceptance of AP demonstration summary that show AP connector mating status when a method exists to determine connector mating status.	D	CofC	
229	IRD SSP 57003	3.9.1.7.3.4 4.3.9.1.7.3.4	A - 57003 NA - 57213	Connector Protection	Protection shall be provided for all demated connectors against physical damage and contamination. Connector protection shall be verified by analysis. Verification shall be considered successful when an analysis shows that protection is provided for all demated connectors against physical damage and contamination.	a) Development, and submittal of analysis summary that demonstrates AP connector protection is provided for all demated connectors against physical damage and contamination. b) JSC review, inspection and acceptance of AP analysis summary to assure AP connector protection is provided for all demated connectors against physical damage and contamination.	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
230	IRD SSP 57003	3.9.1.7.3.4.1 4.3.9.1.7.3.4.1	A - 57003 NA - 57213	Protecting Caps	All connector protective caps shall be tethered. Verification shall be by inspection.	a) Development, and submittal of inspection summary that demonstrates AP flight hardware connector protective caps are tethered. a2) Design review, analysis, and operational assessment to assure all attached payload protective connector caps are tethered.	I	CofC	
					Verification shall be considered successful when an inspection of the Attached Payload flight hardware shows that all connector protective caps are tethered.	b) JSC review, inspection and acceptance of AP inspection summary to assure AP flight hardware connector protective caps are tethered.			
231	IRD SSP 57003	3.9.1.7.3.5 4.3.9.1.7.3.5	A - 57003 NA - 57213	Coding	A. Both halves of mating connectors shall display a code or identifier which is unique to that connector. Coding shall be verified by inspection. Verification shall be considered successful when an inspection shows that both halves of mating connectors display a code or identifier which is unique to that connection.	a,b) Development, and submittal of inspection summary that demonstrates AP coding shows that both halves of mating connectors display a code or identifier which is unique to that connection and labels or codes on connectors are visible when connected or disconnected.	I	CofC	
					B. The labels or codes in connectors shall be located so they are visible when connected or disconnected. Coding shall be verified by inspection. Verification shall be considered successful when an inspection shows that labels or codes on connectors are visible when connected or disconnected.	c) JSC review, inspection and acceptance of AP inspection summary to assure that AP coding shows that both halves of mating connectors display a code or identifier which is unique to that connection and labels or codes on connectors are visible when connected or disconnected.			
232	IRD SSP 57003	3.3.1.7.3.6 4.3.9.1.7.3.6	A - 57003 NA - 57213	Pin Identification	Each pin shall be identified in each electrical plug and in each receptacle. Pin identification shall be verified by inspection.	a1) Development, and submittal of inspection summary that demonstrates AP pin identification of each pin in each electrical plug and electrical receptacle plug or receptacle or on an accompanying chart.	A	CofC	
					Verification shall be considered successful when an inspection shows that each pin in each electrical plug and electrical receptacle is identified either on the plug or receptacle or on an accompanying chart.	a2) Design review, analysis, and operational assessment to assure attached payload connector pins are identified in each electrical plug and receptacle.			
						b) JSC review, inspection and acceptance of AP inspection summary to assure pin identification of each pin in each electrical plug and electrical			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						receptacle plug or receptacle or on an accompanying chart.			
233	IRD SSP 57003	3.3.1.7.3.7 4.3.9.1.7.3.7	A - 57003 NA - 57213	Orientation	Grouped plugs and receptacles shall be oriented so that the aligning pins or equivalent devices are in the same relative position. Orientation shall be verified by inspection.	a) Development, and submittal of inspection summary that demonstrates AP orientation grouped plugs and receptacles are oriented so that the aligning pins or equivalent devices are in the same relative position.	A	CofC	
					Verification shall be considered successful when an inspection shows that grouped plugs and receptacles are oriented so that the aligning pins or equivalent devices are in the same relative position.	a2) Design review, analysis, and operational assessment to assure attached payload grouped plugs/ receptacles are oriented so aligning pins or equivalent devices are in the same relative position. b) JSC review, inspection and acceptance of AP inspection summary to assure grouped plugs and receptacles are oriented so that the aligning pins or equivalent devices are in the same relative position.			
234	IRD SSP 57003	3.3.1.7.3.7.1 4.3.9.1.7.3.7.1	A - 57003 NA - 57213	Spacing	A. Attached payload connector spacing shall be in accordance with SSP 50005, para. 11.10.3.6. Connector arrangement shall be verified by inspection. Verification shall be considered successful when an inspection of the space between connectors and adjacent obstructions comply with the requirement.	a,b) Development, and submittal of inspection summary that demonstrates AP space between connectors and adjacent obstructions and a single row or staggered rows comply with the requirements SSP 50005, para. 11.10.3.6 and connectors minimum clearance between the adjacent wing tabs is 2.5"	A	CofC	
					B. Connector arrangement shall be verified by inspection. Where wing connectors are used, the minimum clearance between the adjacent wing tabs shall be 2.5"on shall be considered successful when an inspection of connectors in a single row or staggered rows comply with the requirements.	c) JSC review, inspection and acceptance of AP inspection summary to assure space between connectors and adjacent obstructions and a single row or staggered rows comply with the requirements.			
235	IRD SSP 57003	3.9.1.7.4 4.3.9.1.7.4	A - 57003 NA - 57213	Cable Restraints	A. The loose ends of cables shall be restrained . Cable/flexhose restraints shall be verified by inspection. Verification shall be considered successful when an inspection shows that the loose ends of cable/flexhose are restrained.	a1&b1) Design review, analysis, and operational assessment to assure AP cable loose ends and connectors that can be mated /demated are restrained at the ends by EVA compatible clamps. c1) Design review, analysis, and operational assessment to assure attached payload cables, conductors, or bundles are secured by means of clamps	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Cables with connectors that may be mated/demated on orbit shall be restrained at the ends by EVA compatible clamps to facilitate EVA maintenance operations. Cable/flexhose restraints shall be verified by inspection. Verification shall be considered successful when an inspection shows that EVA compatible clamps are provided in the proximity of connectors identified for possible mating/demating during on orbit operations.	d1) Design review, analysis, and operational assessment to assure attached payload cables are bundled if multiple cables are running in the same direction.			
					C. Cables, conductors, or bundles shall be secured by means of clamps (unless they are contained in wiring ducts or cable retractors. Cable/flexhose restraints shall be verified by inspection. Verification shall be considered successful when an inspection shows that conductors, bundles, or cables are secured by a means of clamps unless they are contained in wiring ducts or cable retractors.	a2,b2,c2,d2) Development, and submittal of inspection summary that demonstrates AP cable/ flexhose restraints loose ends are restrained, EVA compatible clamps are provided in proximity of connectors for possible mating/demating operations, conductors/ bundles/cables are secured by a means of clamps (unless they are contained in wiring ducts or cable retractors), and multiple cables are running in the same direction are bundled..			
					D. Cable bundles shall be verified by inspection. Verification shall be considered successful when an inspection shows that if multiple cables are running in the same direction, they are bundled. Cables shall be bundled if multiple cables are running in the same direction.	e) JSC review, inspection and acceptance of AP inspection summary to assure inspection summary that demonstrates AP cable/flexhose restraints loose ends are restrained, EVA compatible clamps are provided in proximity of connectors for possible mating/demating operations, conductors/ bundles/cables are secured by a means of clamps (unless they are contained in wiring ducts or cable retractors), and multiple cables are running in the same direction are bundled.			
236	IRD SSP 57003	3.9.1.7.5 4.3.9.1.7.5	A - 57003 NA - 57213	Covers	A. An access cover shall be provided whenever routing maintenance operations would otherwise require removing the entire case or cover, or dismantling an item of equipment. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows that access covers are provided if required.	a1) Design review, analysis, and operational assessment to assure attached payload access cover provides routine maintenance operations would otherwise require removing the entire case or cover, or dismantling an item of equipment	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Closures shall be removable to allow for maintenance of equipment. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows that closures are removable.	b1&c1&d1) Design review, analysis, and operational assessment to assure attached payload closures are removable to allow for maintenance, have positive means of indicating that they are locked, and be capable of sustaining EVA induced loads as specified as specified in Table 3.1.1.2.6-1 e1) Design review, analysis, and operational assessment to assure attached payload bulkheads, brackets and other units do not interfere with removal or opening of covers			
					C. Closures shall have a positive means of indicating that they are locked. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows that closures have a positive means of indicating they are locked.	f1) Design review, analysis, and operational assessment to assure attached payload access covers that are not completely removable are self supporting in the open position g1) Design review, analysis, and operational assessment to assure attached payload equipment housings are designed to provide closures and covers for accessible areas.			
					D. Non-structural closures shall be capable of sustaining EVA induced loads as specified as specified in Table 3.1.1.2.6-1. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows that non-structural closures are capable of sustaining EVA-induced loads as specified in Table 3.1.1.2.6-1.	h1) Design review, analysis, and operational assessment to assure attached payload inaccessible areas are sealed to prevent any loose item from drifting into them.			
					E. Bulkheads, brackets and other units shall not interfere with removal or opening of covers. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows that other units do not interfere with removal or opening of covers.	a2,b2,c2,d2,e2,f2,g2,h2) Submittal of analysis summary that demonstrates AP hardware and flight drawings verify access covers are provided (if required), closures are removable, closures have a positive means of indicating they are locked, non-structural			
					F. All access covers that are not completely removable shall self supporting in the open position. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows	closures are capable of sustaining EVA induced loads as specified in Table 3.1.1.2.6-1, other units do not interfere with removal or opening of covers, covers not completely removable are			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					that covers not completely removable are self-supporting in the open position.				
						self-supporting in the open position, equipment housings in inaccessible areas provide closures and covers, and requirements of 3.9.1.7.5 H have been met.			
					G. Equipment housings (i.e. electrical bays) shall be designed to provide closures and covers for accessible areas. . An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows that equipment housings in inaccessible areas provide closures and covers.	i) JSC review, inspection and acceptance of AP analysis summary to assure AP hardware and flight drawings verify access covers are provided (if required), closures are removable, closures have a positive means of indicating they are locked, non-structural closures are capable of sustaining EVA-induced loads as			
					H. An analysis of payload hardware and flight drawings shall be performed to verify requirement. The verification shall be considered successful when the analysis shows the requirements of 3.9.1.7.5 H have been met. The inaccessible areas shall be sealed to prevent any loose item from drifting into them.	specified in Table 3.1.1.2.6-1, other units do not interfere with removal or opening of covers, covers not completely removable are self-supporting in the open position, equipment housings in inaccessible areas provide closures and covers, and requirements of 3.9.1.7.5 H have been met.			
237	IRD SSP 57003	3.9.1.7.6 4.3.9.1.7.6	A - 57003 NA - 57213	Fasteners	AP fasteners shall conform to the fastener design requirements in SSP 50005, para. 11.9.3 and 14.6.3.3. Verification shall be by inspection. Verification shall be considered successful when it is shown through the inspection of Attached Payload flight drawings that the fastener design requirements are in accordance with SSP 50005, paragraphs 11.9.3 through 14.6.3.3.	a) Development, and submittal of inspection summary that demonstrates AP fastener design requirements are in accordance with SSP 50005, paragraphs 11.9.3 through 14.6.3.3. b) JSC review, inspection and acceptance of AP inspection summary to assure AP fastener design requirements are in accordance with SSP 50005, paragraphs 11.9.3 through 14.6.3.3.	I	CofC	
238	IRD SSP 57003	3.9.1.7.6.1 4.3.9.1.7.6.1	A - 57003 NA - 57213	Engagement Status Indication	A) EVA actuated fasteners/devices shall be visually accessible to ensure proper seating or restraint in stowed or installed . Verification shall be by inspection. Verification shall be considered successful if the inspection shows that EVA actuated fasteners/devices are visually accessible to ensure proper seating or restraint in stowed or installed locations.	a1,b1) Development, and submittal of inspection summary that shows EVA actuated fasteners/devices are visually accessible to ensure proper seating or restraint in stowed or installed locations and visual indication of correct engagement.	I	CofC	
					B) An indication of correct engagement of	c) JSC review, inspection and			

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					fasteners shall be provided. Verification shall be by inspection. Verification shall be considered successful if the inspection shows that EVA actuated fasteners/devices provide indication of correct engagement.	acceptance of AP inspection summary that shows EVA actuated fasteners/devices are visually accessible to ensure proper seating or restraint in stowed or installed locations and provide indication of correct engagement.			
239	IRD SSP 57003	3.9.1.7.6.2 4.3.9.1.7.6.2	A - 57003 NA - 57213	One-Handed Operation	All fasteners shall allow actuation by one hand. Fasteners design and replacement shall not preclude the use of either the right or the left hand.	a1) Design review, analysis, and operational assessment to assure all payload attached fasteners allow actuation by one hand and design/replacement allow for the use of either the right or left hand	D	CofC	
					One handed actuation shall be verified by demonstration. Verification shall be considered successful when fasteners can be actuated with one hand, not to preclude either hand.	a2) Development, and submittal of demonstration summary that shows AP one handed actuation not to preclude either hand. b) JSC review, inspection and acceptance of AP demonstration summary to assure AP one handed actuation not to preclude either hand.			
240	IRD SSP 57003	3.9.1.7.6.3 4.3.9.1.7.6.3	A - 57003 NA - 57213	Fastener Clearances	A) A minimum of 3" shall be provided for clearance between a tool handle engaged on a fastener or drive stud and the nearest piece of hardware.	a1) Design review, analysis, and operational assessment to assure attached payload attached clearances between a tool handle and engaged on a fastener or drive stud have a minimum 3" clearance to the nearest piece of hardware. For the driver -type tool, clearance are to be maintained through 360 degrees	I	CofC	
					For the driver -type tool, clearance shall be maintained through 360 degrees. Fastener clearances shall be verified by inspection. Verification shall be considered successful when an inspection shows that tool clearances are as specified in 3.9.1.7.6.3.				
					B) EVA fasteners shall be separated to provide hand to tool clearance in accordance with SSP 50005, para. 14.6.2.3 Fastener clearances shall be verified by inspection. Verification shall be considered successful when an inspection shows that fasteners are separated to provide clearances in accordance with SSP 50005, Figure 14.6.2.3.	a2) Development, and submittal of inspection summary that demonstrates AP fastener clearances shows tool clearances are as specified in 3.9.1.7.6.3, fasteners are separated to provide clearances in accordance with SSP 50005, Figure 14.6.2.3, and clearances are as specified for fasteners recessed in a robotic interface.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					C) when EVA fasteners are recessed in a robotic interface, the clearance between the fastener and the robotic interface shall allow for insertion, actuation, and removal of the drive end of a standard tool. Fastener clearances shall be verified by inspection. Verification shall be considered successful when an inspection shows that the clearances are as specified for fasteners recessed in a robotic interface.	b) JSC review, inspection and acceptance of AP inspection summary to assure AP fastener clearances shows tool clearances are as specified in 3.9.1.7.6.3, fasteners are separated to provide clearances in accordance with SSP 50005, Figure 14.6.2.3, and clearances are as specified for fasteners recessed in a robotic interface.			
241	IRD SSP 57003	3.9.1.7.6.4 4.3.9.1.7.6.4	A - 57003 NA - 57213	Fastener Access Holes	Covers or shields through which mounting fasteners must pass for attachment to the basic chassis of the unit shall have holes for the passage of fasteners without precise alignment and hand or necessary tool, if either is required to be replaced. Access holes for fasteners shall be verified by inspection.	a) Development, and submittal of inspection summary that demonstrates AP fastener access holes shows that covers/shields which mounting fasteners must pass have holes for passage of the fastener, and hand or necessary tool if either is required to replace, without precise alignment.	I	CofC	
					Verification shall be considered successful when an inspection shows that covers or shields through which mounting fasteners must pass for attachment to the basic chassis of the unit have holes for passage of the fastener, and hand or necessary tool if either is required to replace, without precise alignment.	b) JSC review, inspection and acceptance of AP inspection summary to assure that AP fastener access holes shows that covers/shields which mounting fasteners must pass have holes for passage of the fastener, and hand or necessary tool if either is required to replace, without precise alignment.			
242	IRD SSP 57003	3.9.1.7.6.5 4.3.9.1.7.6.5	A - 57003 NA - 57213	Captive Fasteners	A) External fasteners shall be captive or shall have special provisions to restrain the fasteners. Captive fasteners shall be verified by analysis. Verification shall be considered successful when an analysis shows that all external fasteners are captive when disengaged.	a,b) Development and submittal of analysis summary that demonstrates AP captive fasteners shows that all external fasteners are captive when disengaged and that no fasteners on external hardware are temporary.	A	CofC	
					B) External fasteners shall preclude the use of temporary fasteners. Exclusion of temporary fasteners shall be verified by analysis. Verification shall be considered successful when an analysis shows that no fasteners on external hardware are temporary.	c) JSC review, inspection and acceptance of AP analysis summary to assure AP captive fasteners shows that all external fasteners are captive when disengaged and that no fasteners on external hardware are temporary.			
243	IRD SSP 57003	3.9.1.7.6.6 4.3.9.1.7.6.6	A - 57003 NA - 57213	Quick Release Fasteners	A. Quick release fasteners shall be verified by inspection. Verification shall be considered successful when an inspection shows that fasteners require a maximum of one complete turn to operate.	a1,b1) Development, and submittal of inspection summary that demonstrates AP quick release fasteners require a maximum of one complete turn to operate and provide positive locking in open and close positions.	I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					B. Quick release fasteners shall be verified by inspection. Verification shall be considered successful when an inspection shows that fasteners are positive locking in open and close positions.	a2&b2) Design review, analysis, and operational assessment to assure attached payload attached quick release fasteners require a maximum of one complete turn to operate and provide positive locking in open and closed positions.			
						c) JSC review, inspection and acceptance of AP inspection summary to assure AP quick release fasteners require a maximum of one complete turn to operate and provide positive locking in open and close positions.			
244	IRD SSP 57003	3.9.1.7.6.7 4.3.9.1.7.6.7	A - 57003 NA - 57213	Over Center Latches	A. Over center latches shall be verified by inspection. Verification shall be considered successful when an inspection shows that there is a provision to prevent undesired latch element realignment, interface, or reengagement.	a1,b1,c1) Development and submittal of inspection summary that demonstrates AP over center latches show provisions to prevent undesired latch element realignment, interface, or reengagement; locking features; and latch handle/latch release are operable by one hand.	I	CofC	
					B. Over center latches shall be verified by inspection. Verification shall be considered successful when an inspection show that latch catches have a locking feature.	a2) Design review, analysis, and operational assessment to assure attached payload attached overcenter latches include a provision to prevent undesired latch element realignment, interface, or reengagement. b2) Design review, analysis, and operational assessment to assure attached payload overcenter latch catches have locking features			
					C. Over center latches shall be verified by inspection. Verification shall be considered successful when an inspection shows that the latch handle and latch release are operable by one hand.	c2) Design review, analysis, and operational assessment to assure attached payload latch handle and release are operable by one hand. d) JSC review, inspection and acceptance of AP inspection summary to assure AP over center latches show provisions to prevent undesired latch element realignment, interface, or reengagement; locking features; and latch handle/latch release are operable by one hand.			
245	IRD SSP 57003	3.9.1.7.6.8 4.3.9.1.7.6.8	A - 57003 NA - 57213	Fastener Heads and Knobs	A) Fasteners and knobs suited for gloved hand operation shall have a minimum head diameter of 1.5" and an maximum of 2". Fastener head	a,b) Development, and submittal of inspection and analysis summary that demonstrates AP fastener and knobs for	I	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					type shall be verified by inspection.	suited gloved hand operations have a minimum head diameter of 1.5 inches and a maximum diameter of 2 inches and head height minimum is .75 inches.			
					Verification shall be considered successful when an inspection shows that the fastener and knobs for suited gloved hand operations have a minimum head diameter of 1.5 inches and a maximum diameter of 2 inches.				
					B) Fasteners and knobs shall have a minimum head height of 0.75". Fastener head height shall be verified by inspection. Verification shall be considered successful when an inspection shows that the fastener head height minimum is .75 inches.	c) JSC review, inspection and acceptance of AP inspection summary to assure AP fastener and knobs for suited gloved hand operations have a minimum head diameter of 1.5 inches and a maximum diameter of 2 inches and head height minimum is .75 inches.			
246	IRD SSP 57003	3.9.1.7..6.9 4.3.9.1.7.6.9	A - 57003 NA - 57213	Contingency Override	A) All EVA hand actuated rotational fasteners shall be provided with a standard sized internal or external hexagonal feature for contingency override with a hand tool.	a,b) Development, and submittal of inspection summary that demonstrates AP design drawings incorporate standard size internal or external hexagonal feature for contingency override with a hand tool and does not use cotter pins.	I	CofC	
					Verification shall be by inspection of design drawings. The drawings shall incorporate the specified EVA bolt head. Verification shall be considered successful when the inspection shows that the Attached Payload provides a standard size internal or external hexagonal feature for contingency override with a hand tool.	c) JSC review, inspection and acceptance of AP inspection summary to assure AP design drawings incorporate standard size internal or external hexagonal feature for contingency override with a hand tool and does not use cotter pins.			
					B) Cotter keys shall not be used by EVA . Verification shall be by inspection of design drawings. Verification shall be considered successful when the inspection shows that the Attached Payload does not use cotter pins.				
247	IRD SSP 57003	3.9.1.7.7.1 4.3.9.1.7.7.1	A - 57003 NA - 57213	Contingency EVA Controls	AP EVA controls design shall conform to the requirements of SSP 50005,para 9.2 and 9.3 for the following: A) All EVA actuated switches shall provide tactile feedback and or visual indication of position.	a,b) Development, and submittal of inspection summary that demonstrates AP conformance with SSP 50005, paragraph 9.2, provides tactile and/or visual indication of position of actuated switches, and protection of controls from inadvertent actuation.	I	CofC	
					Verification shall be by inspection of design drawings. Verification shall be considered				

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					successful when the inspection shows that the AP conforms to the requirements in SSP 50005, paragraph 9.2 and provides tactile and/or visual indication of position of actuated switches.				
					B) EVA controls shall be protected from inadvertent activation. Verification shall be by inspection of design drawings. Verification shall be considered successful when the inspection shows that the Attached Payload conforms to the requirements in SSP 50005, paragraph 9.2 and provides protection of controls from inadvertent actuation.	c) JSC review, inspection and acceptance of AP inspection summary to assure AP conformance with SSP 50005, paragraph 9.2, provides tactile and/or visual indication of position of actuated switches, and protection of controls from inadvertent actuation.			
248	IRD SSP 57003	3.9.1.7.7.2 4.3.9.1.7.7.2	A - 57003 NA - 57213	Displays	A) Attached payload EVA display types and locations shall conform to the requirements of SSP 50005, para 9.2 and 9.4. Verification shall be considered successful when the inspection shows that the Attached Payload display types and locations conforms to the requirements in SSP 50005, paragraph 9.2 and 9.4. Verification shall be by inspection of design drawings.	a,b) Development, and submittal of analysis, and operational assessment and inspection summary that demonstrates AP display types/locations conform to SSP 50005, paragraph 9.2 and 9.4, and EVA displays located within the EMU field of view as defined in IRD SSP 57003 3.8.3.1.1.2	I	CofC	
					B) EVA displays shall be located within the field of view permitted by the EMU as defined in Paragraph 3.8.3.1.1.2. Verification shall be by inspection of design drawings. Verification shall be considered successful when the inspection shows that the AP EVA displays are located within the field of view permitted by the EMU as defined in 3.8.3.1.1.2	c) JSC review, inspection and acceptance of AP inspection summary to assure AP display types/locations conform to SSP 50005, paragraph 9.2 and 9.4, and EVA displays located within the EMU field of view as defined in IRD SSP 57003 3.8.3.1.1.2			
249	IRD SSP 57003	3.9.1.7.7.3 4.3.9.1.7.7.3	A - 57003 NA - 57213	Labeling	AP labeling and color coding at EVA worksites and translation paths shall meet the requirements listed in appendix C. Verification shall be by inspection of design drawings.	a1) Development, and submittal of inspection summary that demonstrates AP labeling/color coding conforms to the requirements in Appendix C.	I	Drawing Review and 732 Approval	
					Verification shall be considered successful when the inspection shows that the AP labeling and color coding conforms to the requirements in Appendix C.	a2) Design review, analysis, and operational assessment to assure attached payload EVA worksite and translation pats labeling/color coding are in compliance with requirements listed in appendix C b) JSC review, inspection and acceptance of AP inspection summary to assure AP labeling/color coding conforms to the requirements in IRD SSP 57003 Appendix C.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
250	IRD SSP 57003	3.9.2.1 4.3.9.2.1	A - 57003 NA - 57213	Planned Maintenance and Storage	Equipment that will go into pressurized volume for planned maintenance or storage shall meet the requirements specified in SSP 50005 paras. 6.3.3.1, 6.3.3.2, 6.3.3.3, and 6.3.3.11. Verification shall be by analysis and inspection.	a1) Development, and submittal of analysis and inspection summary that demonstrates AP hardware edge/corners requiring rounding, the use of guards, or covers due to the item being relocated in a pressurized volume that all required edges or corners have been properly machined, covered or guarded.	A or I	CofC	
					An analysis shall be performed using data from drawings, integration documentation, and operational procedures to identify hardware edge and corners requiring rounding, the use of guards, or covers due to the item being relocated in a pressurized volume. A drawing inspection shall show that the required edge and corner rounding, deburring, or cover installation has been accomplished or proper guards are in place.	a2) Design review, analysis, and operational assessment to assure attached payload equipment that will be located in the pressurized volume for planned maintenance/storage meets the requirements in SSP 50005 paras. 6.3.3.1, 6.3.3.2, 6.3.3.3, and 6.3.3.11. b) JSC review, inspection and acceptance of AP analysis and inspection summary to assure AP hardware (due to the item being relocated in a pressurized volume) edges/corners are properly machined, covered or guarded.			
					Verification shall be considered successful when analysis and inspection shows that all required edges or corners have been properly machined, covered or guarded.				
251	IRD SSP 57003	3.9.2.2. 4.3.9.2.2	A - 57003 NA - 57213	On-Orbit Maintenance	A. An analysis of engineering design drawings shall be performed to verify that personnel and equipment mobility aids and restraining devices are provided to support on-orbit maintenance.	a) Development, and submittal of analysis summary that demonstrates AP engineering design drawings to verify personnel/ equipment mobility aids and restraining devices are provided to support on-orbit maintenance.	A	CofC	
					The verification shall be considered successful when the analysis proves that these devices have been incorporated in the system design for the planned on-orbit maintenance.	b) Development, and submittal of analysis summary that demonstrates AP FMEA, ORU selection rationale, and preventive maintenance analysis comply with the ORU selection criteria and apply the allowable tools listed in Tables 3.2-1 and 3.2-2 of SSP 30256:001 or provide adequate physical constraint rationale for exceptions.			
					B. Analysis shall be conducted using the	c) JSC review, inspection and			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					FMEA, ORU selection rationale, and preventive maintenance analysis.	acceptance of AP analysis, inspection, and test summary to assure design drawings verify personnel/ equipment mobility aids and restraining devices are provided for support			
					The verification shall be considered successful when the analysis proves that the selected LSAR on-orbit maintenance tasks comply with the ORU selection criteria, rectify the projected failure modes, satisfy preventive maintenance restrictions, and apply the allowable tools listed in Tables 3.2-1 and 3.2-2 of SSP 30256:001 or provide adequate physical constraint rationale for exceptions.	on-orbit maintenance, FMEA and ORU selection rationale, and preventive maintenance analysis comply with ORU selection criteria identified in IRD SSP 57003, Tables 3.2-1 and 3.2-2 of SSP 30256:001 or provide adequate physical constraint rationale for exceptions.			
252	IRD SSP 57003	3.9.2.2.1 4.3.9.2.2.1	A - 57003 NA - 57213	Corrective Maintenance	Analysis shall be conducted using the FMEA, ORU selection rationale, and preventive maintenance analysis. The verification shall be considered successful when the analysis proves that ORUs comply with	a) Development, and submittal of FMEA, ORU selection rationale, and preventive maintenance analysis to proves that ORUs comply with selection criteria, rectify the projected failure modes, satisfy preventive maintenance analysis restrictions, and meet program defined resupply, return, and crew time allocations.	A	CofC	
					selection criteria, rectify the projected failure modes, satisfy preventive maintenance analysis restrictions, and meet program defined resupply, return, and crew time allocations.	b) JSC review, inspection and acceptance of AP FMEA, ORU selection rationale, and preventive maintenance analysis assures ORUs comply with selection criteria, rectify the projected failure modes, satisfy preventive maintenance analysis restrictions, and meet program defined resupply, return, and crew time allocations.			
253	IRD SSP 57003	3.9.2.2.2 4.3.9.2.2.2	A - 57003 NA - 57213	In Situ Maintenance	Analysis shall be conducted using the FMEA, ORU maintenance planning, and preventive maintenance analysis. The verification shall be considered successful when the analysis proves that the selected LSAR on-orbit in situ maintenance tasks rectify projected failure modes not corrected by ORU removal and replacement without operational capability degradation and satisfy preventative maintenance analysis restrictions.	a) Development, and submittal of analysis summary that demonstrates on-orbit in situ maintenance tasks rectify projected failure modes without operational capability degradation and satisfy preventative maintenance analysis restrictions when on-orbit removal/replacement is not applicable and end item functionality shall be restored by maintenance.	A	CofC	
						b) JSC review, inspection and acceptance of AP analysis summary to assure AP FMEA, ORU maintenance			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						planning, and preventive maintenance of selected LSAR on-orbit in situ maintenance tasks rectify projected failure modes not corrected by ORU removal.			
254	IRD SSP 57003	3.9.2.2.3 4.3.9.2.2.3	A - 57003 NA - 57213	ORU Intermediate Maintenance	Analysis shall be conducted using the FMEA, ORU selection rationale, and program defined resupply, return, and crew time allocations.	a) Development, and submittal of analysis summary that demonstrates AP FMEA, ORU selection rationale, and program defined resupply, return, and crew time allocations for selected LSAR on-orbit intermediate maintenance tasks comply with the ORU selection criteria, rectify the projected failure modes, and meet program defined resupply, return and crew time allocations.	A	CofC	
					The verification shall be considered successful when the analysis proves that the selected LSAR on-orbit intermediate maintenance tasks comply with the ORU selection criteria, rectify the projected failure modes, and meet program defined resupply, return and crew time allocations.	a2) Design review, analysis, and operational assessment to assure attached payload end item ORUs designed for on-orbit intermediate maintenance are packaged for the removal/replacement of SRUs and other approved off equipment repairs b) JSC review, inspection and acceptance of AP analysis to assure selected LSAR on-orbit intermediate maintenance tasks comply with the ORU selection criteria and meet program resupply, return and crew time allocations.			
255	IRD SSP 57003	3.9.2.2.4 4.3.9.2.2.4	A - 57003 NA - 57213	Preventative Maintenance	Analysis shall be conducted using the FMEA and preventive maintenance analysis.	a) Development, and submittal of analysis summary that demonstrates AP FMEA and preventive maintenance analysis proves selected LSAR on-orbit preventive maintenance tasks and satisfy preventive maintenance analysis restrictions.	A	CofC	
					The verification shall be considered successful when the analysis proves that the selected LSAR on-orbit preventive maintenance tasks rectify the projected failure modes and satisfy preventive maintenance analysis restrictions.	a2) Design review, analysis, and operational assessment to assure AP preventative maintenance is permitted to retain end item functionality b) JSC review, inspection and acceptance of AP analysis summary to assure selected LSAR on-orbit preventive maintenance tasks satisfy preventive maintenance analysis restrictions.			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
256	IRD SSP 57003	3.9.2.2.5 4.3.9.2.2.5	A - 57003 NA - 57213	On-Orbit Maintenance Backup	Analysis shall be conducted using the physical constraints of the ORU, the end item installation physical constraints and the applicable maintainability and human factors criteria.	a1) Development, and submittal of analysis summary that demonstrates AP physical constraints of the ORU, the end item installation physical constraints and the applicable maintainability and human factors criteria that no more than two astronauts would be required to perform the ORU remove and replace actions which have been designed and planned for robotic execution.	A	CofC	
					The verification shall be considered successful when the analysis of LSAR maintenance planning proves that no more than two astronauts would be required to perform the ORU remove and replace actions which have been designed and planned for robotic execution.	a2) Analysis and operational assessment to assure AP equipment that will be removed/replaced by robotics includes a back-up EVA capability to remove/replace attached payload equipment. b) JSC review, inspection and acceptance of AP analysis summary to assure AP/ORU end item installation physical constraints and applicable maintainability/human factors criteria that no more than two astronauts would be required to perform the ORU remove and replace actions which have been designed and planned for robotic execution.			
257	IRD SSP 57003	3.9.2.2.6 4.3.9.2.2.6	A - 57003 NA - 57213	Access for On-Orbit Maintenance	Analysis shall be conducted using the FMEA, ORU selection, preventive maintenance analysis, development program test results, and program defined crew time allocations.	a1) Development, and submittal of analysis using FMEA, ORU selection, preventive maintenance, development program test results, and program defined crew time allocations that proves LSAR on-orbit organizational maintenance tasks in accordance with SSP 50005, paragraphs 12.3.1.2/ 12.3.1.3.	A	CofC	
					The verification shall be considered successful when the analysis proves that LSAR on-orbit organizational maintenance tasks are in accordance with SSP 50005, paragraphs 12.3.1.2, Physical Accessibility Design Requirements, and 12.3.1.3, Visual Access Design Requirements and meet program defined crew time allocations.	a2) Design review, analysis, and operational assessment to assure attached payload provides access to all locations requiring on-orbit maintenance as specified in SSP 50005, paras. 14.6.2.3A, 14.6.2.3.C, and 14.6.2.3G b) JSC review, inspection and acceptance of AP analysis, inspection, and test summary to assure analysis using FMEA, ORU selection,			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						preventive maintenance, development program test results, and program defined crew time allocations that proves LSAR on-orbit organizational maintenance tasks in accordance with SSP 50005, paragraphs 12.3.1.2/ 12.3.1.3.			
258	IRD SSP 57003	3.9.2.2.6.1 4.3.9.2.2..6.1	A - 57003 NA - 57213	EVA Access to Fasteners	An inspection shall be performed to ensure that all recessed robotics compatible EVA fasteners provide clearance between the outer edge of the fastener and the robotics interface so that the drive end of a standard tool can be inserted, actuated, and removed.	a1) Development and submittal of inspection summary that demonstrates AP EVA fasteners are compatible and provide clearance between the robotic edge outer fastener edge interface so standard tool drive end can be inserted, actuated, and removed for each recessed robotics compatible EVA fasteners, clearance between the fastener outer edge.	A	CofC	
					The inspection shall be considered successful when the Attached Payload and component drawings document that for each recessed robotics compatible EVA fasteners, clearance between the fastener outer edge and robotics interface have been provided.	a2) Design review, analysis, and operational assessment to assure AP EVA fasteners are recessed in a robotic interface, the clearance between the fastener and the robotic interface allow for insertion, actuation, and removal of the drive end of a standard EVA tool as specified in SSP 50005, para. 14.6.2.3			
						b) JSC review, inspection and acceptance of AP inspection summary to assure inspection summary that demonstrates AP EVA fasteners are compatible and provide clearance between the robotic edge outer fastener edge interface so standard tool drive end can be inserted, actuated, and removed for each recessed robotics compatible EVA fasteners, clearance between the fastener outer edge.			
259	IRD SSP 57003	3.3.2.2.7 4.3.9.2.2.7	A - 57003 NA - 57213	Standard On-Orbit Diagnostic Equipment	Analysis shall be conducted using the LSAR maintenance planning resource reports.	a) Development, and submittal of analysis summary and operational assessment using the LSAR maintenance planning resource reports that demonstrates on-orbit organizational maintenance tasks apply allowable diagnostic equipment listed in SSP 30256:001, Tables 3.2-1, 3.2-2, or provide adequate physical constraint rationale for exceptions.	A	CofC	

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					The verification shall be considered successful when the analysis proves that the LSAR on-orbit organizational maintenance tasks apply the allowable diagnostic equipment listed in SSP 30256:001, Tables 3.2-1, 3.2-2, or provide adequate physical constraint rationale for exceptions.	b) JSC review, inspection and acceptance of AP analysis summary to assure LSAR maintenance planning organizational maintenance tasks apply allowable diagnostic equipment listed in SSP 30256:001, Tables 3.2-1, 3.2-2, or provide adequate physical constraint rationale for exceptions.			
260	IRD SSP 57003	3.3.2.3 4.3.9.2.3	A - 57003 NA - 57213	Ground Maintenance	Analysis shall be conducted using ORU selection criteria, Repair Level Analysis (RLA), and other logistic analyses of repair feasibility.	a1) Development and submittal of analysis summary using ORU selection criteria, Repair Level Analysis (RLA), and other logistic analyses of repair feasibility to demonstrate depot resources are available or feasible for LSAR Depot maintenance tasks selected in accordance with program approved Logistics Support Analysis (LSA) physical and economic criteria.	A	Cof C	
					The verification shall be considered successful when the analysis proves that depot resources are available or feasible for LSAR Depot maintenance tasks selected in accordance with program approved Logistics Support Analysis (LSA) physical and economic criteria.	a2) Design review, analysis, and operational assessment to assure attached payload end item ORUs designated for repair are ground repairable. b) JSC review, inspection and acceptance of AP analysis summary to assure feasibility for LSAR Depot maintenance tasks selected in accordance with program approved Logistics Support Analysis (LSA) physical and economic criteria.			
261	IRD SSP 57003	3.10 4.3.1.0	A - 57003 NA - 57213	Nameplates and Product Marking	A. Labels on integrated AP, all (installed in the AP or separately) AP elements, loose equipment, consumables, ORUs, crew accessible connectors and cables, switches, indicators, and controls shall be verified by inspection. The inspection shall be of the FCSD approval documentation.	a,b) Development, and submittal of analysis and inspection summary that demonstrates AP labels on integrated units, loose equipment, consumables, ORUs, crew accessible connectors and cables, switches, indicators, and controls and analysis to verify that marking techniques shall not degrade the structural integrity of the equipment.	A&I	CofC	
					The verification shall be considered successful when integrated Attached Payloads, all (installed in the AP or separately) AP elements, loose equipment, consumables, ORUs, crew accessible connectors and cables, switches, indicators, and controls have been shown to	c) JSC FCOD and Materials approval to assure inspection summary that demonstrates AP labels on integrated units, loose equipment, consumables, ORUs, crew accessible connectors and cables, switches, indicators, and			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
					have FCSD approved labels. The instructions for FCSD to follow in granting approval of labels are located in Appendix C.	controls and marking techniques shall not degrade the structural integrity of the equipment.			
					B. An analysis of engineering design drawings shall be performed to verify that marking techniques shall not degrade the structural integrity of the equipment. The verification shall be considered successful when the analysis proves that the requirements have been satisfied.				
262	IRD SSP 57003	C.3.5.5.2	A	Alignment Marks/Interface Identification	(1) Alignment marks shall be applied to mating parts. (2) Alignment marks shall consist of a straight or curved line of a width and length sufficient to allow accurate alignment.	a1) Development, and submittal of inspection summary that demonstrates AP alignment marks are applied to mating parts and consist of a straight or curved line of a width and length sufficient to allow accurate alignment.			
					B. Coding (1) Both halves of mating connectors shall display a code or identifier which is unique to that connection (2) The labels or codes on connectors shall be located so they are visible when connected or disconnected.	a2) Development, and submittal of inspection summary that demonstrates AP coding to verify both halves of mating connectors display a code or identifier which is unique to that connection and located so they are visible when connected or disconnected. b) JSC review, inspection and acceptance of AP inspection summary to assure alignment marks are applied to mating parts and consist of a straight or curved line of a width and length sufficient to allow accurate alignment and coding to both halves of mating connectors unique to that connection located so they are visible when connected or disconnected.			
263	IRD SSP 57003	C.3.5.9.I.	A	Caution and warning/Control of Exposed Risk	External hardware posing a risk to EVA crew in the primary and secondary translation paths and established worksites shall be placarded and controlled as specified in Table C-1.	a) Development, and submittal of analysis summary that demonstrates AP EVA primary and secondary translation paths/ established worksites are placarded and controlled as specified in Table C-1 b) JSC review, inspection and acceptance of AP analysis to assure analysis summary that demonstrates AP EVA primary and secondary translation paths/ established worksites are placarded and controlled as			

Reqm't No.	Document	Paragraph	Applicability	Requirement Title	Shall Statement	Verification Success Criteria	Facility	Verif. Method	Results
						specified in Table C-1			
264	SSP 57231	Table of Contents	NA	Table of Content					Several bookmarks are undefined
265	SSP 57231	2	A	Documentation	In event of a conflict between the documents referenced and the contents of this ICD shall be considered a superseding requirement. ????				Clarify the superceding document requirements?
266	SSP 57231	3.1.4.2	A - 57003	Acceleration Environment	The AMS-02 and its subsystems shall be designed to withstand an on-orbit acceleration environment including reboost having peak transient accelerations of up to 0.25 g's, a vector quantity acting in any direction. Table 3.1.5.3 provides the functional interface compatibility of the AMS-02 payload with the station from induced loads.	a) Development, and submittal of analysis and test summary that demonstrates AP subsystems are designed to withstand an on-orbit acceleration environment including reboost having peak transient accelerations of up to 0.25 g's, a vector quantity acting in any direction. SSP 57213 (Table 3.1.5.3) provides the functional interface compatibility of the AMS-02 payload with the station from induced loads.  b) JSC review, inspection and acceptance of AP analysis and test summary to assure AP subsystems are designed to withstand an on-orbit acceleration environment including reboost having peak transient accelerations of up to 0.25 g's, a vector quantity acting in any direction. SSP 57213 (Table 3.1.5.3) provides the functional interface compatibility of the AMS-02 payload with the station from induced loads.	?	CofC	
267	SSP 57231	Table 4.2-1 3.7.6.3 A/B	??	EBCC Thermal Requirements					Are there any planned updates to this section
268	SSP 57231	Table C.2	??	TBR Issues	Listing of open issues				Are there any updates to this section

**APPENDIX D: REQUIREMENT VERIFICATION MATRIX FOR AMS-02 EXPERIMENT HARDWARE**

Validation Product # <sup>1</sup>	Activity <sup>2</sup>	Objective <sup>3</sup>	Valid. Method <sup>4</sup>	Facility or Lab <sup>5</sup>	Phase <sup>6</sup>	Perform. Org <sup>7</sup>	Results <sup>8</sup>
1							

<sup>1</sup> Unique identifier for verification product – include detector or subsystem identifier (i.e. TRD–X, TCS–Y, Electronics–Z, etc.)

<sup>2</sup> Provide a short title of activity performed (Beam Test of ..., Inspection of ... Hardware to Drawing , etc.)

<sup>3</sup> Describe requirement that will be verified

<sup>4</sup> Verification Method for the AMS-02 requirement (Analysis, Inspection, Demonstration, or Test)

<sup>5</sup> Facility or laboratory used to perform the validation

<sup>6</sup> Phase in which the verification/validation will be performed:

Example:

1. During product selection process
2. Prior to final product selection (if COTS) or prior to PDR
3. Prior to CDR
4. During box-level Functional
5. During System-level Functional
6. During end-to-end Functional
7. During Integrated Vehicle Functional
8. During On-orbit Functional

<sup>7</sup> Organization responsible for coordinating the verification activity

<sup>8</sup> Indicate the objective evidence that verification activity occurred

## **APPENDIX E: VERIFICATION OF AMS-02 SAFETY REQUIREMENTS**

Leland's Matrix goes here